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Leaf-Hoppers and their Natural Enemies

(PT. IX. LEAF-HOPPERS—HEMIPTERA)

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LETTER OF TRANSMITTAL.

Honolulu, T. H., January 17th, 1906.

To the Committee on Experiment Station, H. S. P. A., Honolulu, T. H.

Gentlemen:—I, herewith, submit for publication the ninth part of the Bulletin on "Leaf-Hoppers and Their Natural Enemies," which deals with the Leaf-Hoppers themselves, and has been prepared by Mr. G. W. Kirkaldy, Assistant Entomologist of this Division.

Yours obediently,

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Director, Division of Entomology.

GENERAL INTRODUCTION.

The Hemiptera, or Rhynchota, are readily distinguished from all other orders of insects by the structure of the mouth, which consists of a grooved sheath, usually in the form of an elongate proboscis, in which lie enclosed four setae; in some respects the Order is perhaps the most isolated of all true insects, and is certainly in many more, one of the most interesting.

As Dr. Sharp has very truly said, "there is probably no order of insects that is so directly connected with the welfare of the human race as the Hemiptera; indeed, if anything were to exterminate the enemies of Hemiptera, we ourselves should probably be starved in the course of a few months."

It is not alone the exhaustion consequent upon the rapid draining of the plant's juices by the Hemipteron's almost microscopic mouth-setae, that is so deleterious; it is the addition of the horde of fungus spores which often subsequently attack the wounded surface, and quickly multiplying, penetrate into the tissues of the plant, causing decay and death.

Here should be noted a common error among entomologists who are not specialists in Hemiptera. The probocis-like rostrum (*labium*) probably *never* penetrates the tissues, neither vegetable nor animal, unless these be already lacerated by the setae; it is simply a sheath to protect the delicate piercing organs, and more or less of a fulcrum to steady their operations.

Such injurious Hemiptera as the Chinchbug (*Blissus leucopterus*) the Bed-bug (*Clinocoris lectularius*) the Cotton Stainer (*Dysdercus suturellus*), the Coffee-blight (*Helopeltis antonii*), the Plantlice (*Aphidae*), the White flies (*Aleyrodidae*) and the Mealy bugs and Scales (*Coccidae*), are household names and to these must be added the Sugar-cane Leaf-hopper (*Perkinsiella saccharicida*).

Six hundred million dollars would be an exceedingly conservative estimate of the values of the damage occasioned all over the world each year by the depredations of the Hemiptera, taking everything into consideration.

And one cause of this devastation is the extraordinary rapidity of increase, which were it not for restraining parasites and predators, would in a year or two leave not a single green leaf on the earth. Osborn estimates that in North America, one-

fourth, if not one-half, of all the grass growing annually is destroyed by leaf-hoppers.

The calculations of Reaumur and Huxley regarding the increase of parthenogenetic Aphidae are classic; Reaumur thought that one Aphid might be the mother of 5,904,900,000 in one month, while Huxley supposed that the tenth brood alone of a single Aphid—*if all the members survived*—would contain more ponderable substance than half a million of stout men. Buckton, however, shows that this is much underestimated and calculates that at the expiration of *300 days*, the progeny of one Aphid (each Aphid producing 20 only) would be the 15th. power of 210, which is the almost inconceivable number of 17,000,000,000,000,000,000,000,000,000,000! and this, I believe, is really considerably underestimated.

In comparison with these stupendous figures, the generation of the cane leaf-hopper sinks into insignificance, but taken by itself is sufficiently serious.

It is very difficult to base calculations on this extraordinarily variable insect in respect of the number of eggs deposited, and the length of time taken for their metamorphoses, but supposing each hopper to lay only 50 eggs, (the sexes to be about equal) and there to be but 6 broods in the year, then the undisturbed progeny of one impregnated female would amount in one year to very little less than 500,000,000.

As an offset to this, there are but few beneficial Hemiptera. The predaceous Reduviidae often attack our friends and foes indiscriminately, for example it seems a matter of indifference to *Zelus peregrinus* whether it seizes the destructive *Perkinsiella* or the friendly *Coccinella*. Certain Coccidae exude merchantable wax and others provide formerly important dyes, while certain waterbugs furnish food for game and cage-birds or even to some races of man, but the total value is insignificant.

BIOLOGICAL SURVEY.

(a) LIFE HISTORIES OF HOPPERS.

Compared with the Life Histories of Hymenoptera, Diptera, and certain Coleoptera, for example, those of the leaf-hoppers are, as a rule, of small interest.

The outward form, at least, is generally, in the nymphal instars, very similar to that of the adult, the latter differing principally in maturation of the organs of flight and reproduction, together with an increase in the number of tarsal segments, and modifications, mostly slight, in the form of the head.

There is also comparatively little scope for multifariousness in the *habits* of the leaf-hoppers. Some are abnormal, others live among grasses and lowly herbage; some in dry pastures, others in reedy margins of lakes and streams. Many are attended more or less assiduously by ants, a few are found actually associated with the latter in their nests, though their role there is unknown. Some are solitary, other herd in flocks, among the most curious of the latter being such genera of the Derbinae as *Philadelphcia* and *Sardis* which sit on the undersurface of leaves in ordered rows with their elongate tegmina raised perpendicularly over the back.

The different superfamilies may be easily recognized apart, in the nymphal instars as in the adult state. The Fulgoroidea are extraordinarily sensorized, the head being almost always furnished with many specialized sensory pits, these often occuring also on the nota, tegminal pads and even on the abdomen. I believe that the number and disposition of these organs will prove of great value in future classification. The genae, antennae, etc., are much as in the adult.

In the other superfamilies the pits are apparently entirely absent, though there are sometimes simple, scattered piligerous pits on the abdomen. The Cicadoidea have the anterior femora greatly thickened and spinose. The nymphal Tetigonioidea partake of the general characteristics of the adults, tho in the Membracidae, many nymphal forms are very strongly granulate. These granulations, however, not being pierced or piliferous. (Pl. XXIV, figs. 10-12.)

(see for example De Geer, more recently Porter and Fabre, also for curious American forms, Ball.) The name of "Cuckoo Spit," applied to these forms in Europe, dates from classic times, when it was believed that the insects were born from the saliva of cuckoos; the French "Crachat de Grenouille" indicates credence in another supposed origin. The adults are termed "Frog-hoppers" in England. The nymphs and adults of *Philagra parva* swarm in Australia on *Casuarina* trees, the former enveloping themselves in froth after the manner of *Cercopis*. The nymph of the Madagascan *Ptyclus goudoti* Bennett, possesses the power of discharging clear water in such considerable quantities as to resemble light rain, this activity being naturally greater at noontide. Goudot estimated that some seventy individuals could emit a quart in an hour and a half.

It has been stated (see, for example, Amyot & Serville) that the nymphs are thus enveloped to guard them from carnivorous insects; on the contrary, DeGeer notes, what has been often observed since, viz: that these nymphs are frequently ravished from their spume by small Fossorial Hymenoptera, while Birds are also said to prey upon them. The froth in reality serves to protect their soft bodies from the heat of the sun, as when taken from this cover and not allowed moisture with which to re-envelope themselves, they soon shrivel up and perish.

Certain Australian forms, however, construct calcareous cases of helicoidal or serpulideous form and attach them to twigs; usually of *Eucalyptus*. These cases were discussed twenty years ago by Ratte since when nothing original has been published on them.

The case is fixed to a twig from two to seven feet above the ground, generally a little or immediately above the insertion of a leaf; and its opening is turned upwards. The shape varies according to genus and species. Some figured by Ratte are actually helicoidal, from this they uncoil till forms are found which are quite or almost straight, though tapering, the widening from the base of course corresponding to the growth of the nymphs. *Polychaetophyes* Kirkaldy has larger, coarser tubes, somewhat stalactitic in ornamentation, while those of *Pectinariophyes* Kirkaldy are smaller and more delicate. The position of the larva within is reversed, the head being placed downwards, (Ratte says that the helicoidal form is an exception,) so that the anus is found at the mouth of the tube. Under cover of the case, at the basal end of which is a slit, the nymph sucks the sap of the tree; occasionally it moves backwards and emits a

drop of clear liquid at the mouth of the tube which is habitually half or nearly full of this liquid, the production being increased in warm weather. Eucalypti are rich in calcium compounds and the lime of the shell is evidently derived from the sap of the tree. Ratte roughly calculated a proportion of 75 per cent of carbonate of lime, the insoluble remains being considered as chitinous matter. In the nymph, two of the tergites (apparently 2nd and 3rd in the forms I have seen) are curiously modified, being much enlarged and more strongly chitinized than the rest of the abdomen, there is a longitudinal false suture. This structure acts as an operculum. (Pl. XXIII figs. 12 and 13.)

Ratte describes them all under the generic name *Ptyelus*, but I cannot place them there and moreover at least four genera are required for their reception. *Polychaetophyes* and *Pectinariophyes* are described later on.

The nymphs of the Sinhalese *Machaerota guttigera* Westwood, construct tubes fixed to the twigs of *Adansonia digitata*, liquid exuding drop by drop from the mouth of the tube.

(2) Fulgoroidea.

As previously mentioned the nymphs in this superfamily are extraordinarily richly endowed with special sensory organs, i. e., large, punctured, granules. I have refrained from discussing the grouping of these organs in the various subfamilies, as my material is as yet insufficient.

Fulgoridae: The nymphs in the family seem to resemble the adults very strongly, but the stages have not been worked out. *Pyrops* has been figured by Burmeister.*

Asiracidae: I have observed the metamorphoses more or less completely of several species, but only outline them here, as later on, I hope to be able to compare all the stages in a number of forms. The study of the nymphal instars will, it is evident, be a great aid in the natural classification of this difficult group.

Perkinsiella saccharicida.

(Pl. XXVI, figs. 1-5.)

Copulation takes place at night, the adult hoppers, most of which lie still or hidden by day, emerging in crowds from their concealment at or shortly before dark.

* Townsend has noted the oviposition of the Cixiine *Oecleus*, (Psyche 1892 VI, 353) and Osborn has related the life-habits of the root-inhabiting Cixiine *Myndus radicis* (Ohio Nat. 1903 IV, 43.)

"The eggs are laid in a chamber formed by the ovipositor of the female in the tissues of the leaf or in the stem of the cane. The ovipositor is held at right angles to the ventral surface, and its point of attachment just behind the posterior legs is very clearly seen when the tip is inserted into the tissues of the leaf. The number of eggs contained in one of these chambers varies considerably. Lately in Hamakua district I carefully opened some hundreds of these chambers and found the number of eggs in each to be from one to twelve in number. That end of the eggs which is nearest the external surface is the head of the future leaf-hopper and the red pigment spots, which form the eyes of the newly-emerged insect, are conspicuous at some distance behind the narrow apical extermity of the egg before it hatches. In the leaves the eggs are deposited on either surface of the thicker parts, and being of elongate form, they usually reach about half way through the tissues. The scar is always visible and is often covered with a little whitish excretion.* The apex or head of the eggs is generally just about level with the surface of the leaf, but sometimes they even protrude a little from the orifice of the chamber. The young emerge perpendicularly, head first, sometimes two together from the chamber, and as they emerge, the appendages at first apparently stuck to the body become free, and the little insect is at once active, and may be seen to perform peculiar sidling or retrograde movements similar to those of older ones or of the adult. As a number of individuals generally hatch from a single chamber, and as the chambers are extremely numerous in a single leaf, very many being sometimes present in a square inch of surface, and as also in stripped cane thousands of these chambers may be present in a single stick, the total number of leaf-hoppers that can, and sometimes do, emerge from a single stick and its crown of leaves is almost incredible.

"The young when they hatch are of sociable nature and gregarious and especially congregate at the base of the leaves, and this habit is also largely retained by the adults, which often also form large flocks in the seclusion of the youngest leaves of the crown. It is in the immature stages while growth is proceeding that the chief damage to the cane is done and the great excretion of the honey-dew taket place." (Perkins.)

The first nymphal instar is conspicuous on account of the

* The secretion is very feeble compared with that of the Antillean *Stenocranus saccharivora* (Westwood), or some of the North American species investigated by Swezey.
G. W. K.

produced head. The vertex is a trifle longer than wide, extending well in front of the eyes and wider between them than an eye. I cannot trace any transverse or discal keels. On the frons there are *two keels* (which do not meet on the vertex or elsewhere), which are rounded convexly. These do not unite at the apical margin of the frons, nor do they meet the lateral keels there. The frons exterior to these submedian keels is wide and covered with sensory organs. The second segment of the antennae is large and stout but short. I cannot trace any sensory organs. The tarsi are bisegmentate,, the posterior pair being provided each with a small mobile spur.

The second and third instars are not remarkable, except that the spur lengthens, the head shortens and the usual changes take place in the thorax. The fourth instar is very close to the adult, except that the body is still covered with sensory organs and the submedian keels are still separate, not uniting at the apical margin of the frons. In this instar, the sensory organs on the antennae are very conspicuous.

That the study of the nymphal instars will prove very helpful to a knowledge of the adults, may be inferred from the genera *Peregrinus* and *Phacalastor*. The only conspicuous difference between *Peregrinus maidis* (the "Corn-hopper") and *Phacalastor pseudomaidis* (the "false Corn-hopper") is that in the former the tegmina are plain, in the latter the veins are very strongly and closely granulated. However, in the former the nymphs are smooth and unicolorous (yellow), in the latter they are granulate and are whitish, spotted and banded with dark brown. Unfortunately, nymphs of the other species of the genus were not obtainable to determine whether these characters are generic or only specific.

Mr. Ballou kindly sent me eggs, nymphs and imagines of *Stenocranus saccharivora* (too late for study in time to incorporate with this part); the ova are deposited in sugar cane after the fashion of *Perkinsiella*, but are somewhat densely covered with white flocculence, as are the nymphs and the adults.

Eutropistidae. Under the name *Dictyophora pallida*, Cotes has figured some of the stages of an*Eutropistid*. Probably a new genus is required, as *Cicada pallida* is not a *Dictyophorine*. Cotes refers it to subfam. *"Eurybrachydinae."*

The eggs are laid along the natural hollow of the midrib of sugar cane (not inserted, as in the Asiracidae) in masses, each cluster containing from three to thirty eggs; these are thickly

covered with flocculence. The nymphs have elongate heads, but feebly so compared with the adult.

In the *Poekillopteridae*, Swezey has partially worked out the life-history of the North American *Ormenis septentrionalis*, while the allied *Siphanta acuta* has been partially worked out by myself in these islands.

In the Sinhalese *Phromnia marginella* (Fabr.), the eggs are laid in considerable numbers in the bark of the twigs of *Elaeodendron* and are apparently thickly covered with flocculent matter. The nymphs cluster like sheep* on the plant and thickly covered by the white flocculent matter. This is by no means true wax, as it consists of fibrous matter, which does not melt, but decomposes when heated and does not dissolve in naphtha. This flocculence is very characteristic of the Fulgoroidea, being more or less present in almost all (all?) forms. In some (*Cixius* etc.) it forms a short broad appendage to the body; in *Phromnia, Phenax, Lystra* and others it is long, even enormously long, as much as 5 inches in *Phenax auricoma*, both in nymphs and adults. Sharp states (Insects II 576) that this "wax" is used by the Chinese for candles and other purposes and is said to be much esteemed in India. He is however, merely repeating an old tale, the error of which was exploded by Cotes in 1893. The Indian flocculence is not commercially esteemed, and the Chinese wax is manufactured from Coccids of the genera *Ceroplastes* and *Ericerus*. The metamorphoses of *Phromnia* have been figured in part by Cotes.

The as yet small and little known sub-family Amphiscepinae (Acanaloniinae) seems to be a development of the Poekillopterinae (Flatinae) in the direction of disintegration of the tegminal venation; the posterior tibiae are spineless (or at least only bristly) in the adult, but Swezey, who has partly worked out the life-history of the North American *Amphiscepa bivittata*, has discovered an interesting fact, viz: that the nymphs have three spines on the posterior tibiae like the typical Poekillopterinae. *Amphiscepa*, however, was placed by Stal in the Issinae.**

(b) FLIGHT ORGANS.

Leaf-Hoppers seem, as a rule, to be nocturnal, flying and feeding at that time. The power of flight, however, may be said

* The natives of Garhwal in India "eat the sugary secretion and call the insect *Dhaberi*, i. e. "sheep," on account of their habit of clustering together and jumping away when disturbed." (Cotes, p. 97)

** The life history of the remarkable *Bruchomorpha oculata* is recorded as having been related by Uhler in the Standard Nat. Hist. II, 234.

to be, as a whole and comparatively speaking, feeble; although doubtless capable at times of extended flight, particularly when aided or compelled by the wind, as a rule they seem to prefer, by day, at least, to trust to their legs for locomotion, as indeed is implied by their popular name. "On certain occasions, however ,they have been seen flying in one direction in the day time in such numbers as to form a migratory swarm, quite like that which occurs in the case of certain locusts, dragon-flies, butterflies and other insects." "It would appear from observations made, that these leaf-hopper migrations are largely due to the fact that the food supply in the place whence they originate has become exhausted or impoverished by the number of the insects." (Perkins.)

The maximum amplitude, in comparison with the size of the body, is attained by the Poekillopteridae, which however, are but feeble flyers; actual extent is greatest among the Fulgoridae, which likewise are not distinguished for powerful flight. In many Issidae and other forms, tegmina are fully developed, but are corneous and often convex, while the wings are also often rudimentary. Perhaps the most remarkable tegmina are found in certain Derbidae, (*Philadelphcia &c*) in which they are very elongate and narrow.

In this group is developed very largely the remarkable and little understood phenomenon of pterygo-polymorphism; that is to say that in the same species there may be two or more forms of tegmina and wings—sometimes a sexual di-or polymorphism, sometimes not—from completeness to great reduction or almost entire absence. It is especially encountered in the Asiracidae and in the Tetigoniid *Phrynomorphus* and its allies; in the Heteroptera it occurs extensively in the Gerridae and Nabidae.

Among Hemipterists, the subject has been discussed at some length by John Sahlberg (1871 pp. 19-23) and O. M. Reuter (1875).

The North American and Australian forms have as yet been too slightly investigated; nor am I aware of the exact proportions in the palaearctic forms, but Sahlberg states that 70 out of the 263 Scandinavian Leaf-hoppers (in 1870) are pterygo dimorphic, that is, more than one-fourth.

In most of the dimorphic Heteroptera (and in speaking now of the "poly-" or "dimorphism," I am alluding only to the poly- or dimorphism of the organs of flight) the thorax is somewhat profoundly modified, by the reduction of the organs of flight, owing doubtless to the degeneration of the supporting mus-

cles. In the leaf-hoppers on the other hand there seems little difference in this respect, probably due to the fact that the thoracic muscles are already somewhat feeble and little adapted for strong flight.

In polymorphism there are two well marked forms, the extremes, that is, of *macropterism* and *brachypterism*, as well as numerous *intermediate* forms sometimes.

In older times, it was supposed that the brachypterous (or apterous) forms were sexually immature, and later, when macropterous and apterous forms were observed in copulation, it was supposed that they were nymphs capable of procreation. These apterous or brachypterous forms have been reared from ordinary nymphs and are completely mature as regards their sexual apparatus.

The genus *Perkinsiella* affords a good example. There are 4 known species, closely allied but abundantly distinct. Two occur in Australia (one also in Hawaii) one in Viti, one in Java; the first three have been abundantly investigated by Koebele and Perkins, the fourth by Breddin.

(1) *saccharicida* Kirkaldy: the males always macropterous, the female is di- (or more or less poly-) morphic.

(2) *graminicida* Kirkaldy: as far as known the male is always macropterous, the female brachypterous.

(3) *vitiensis* Kirkaldy: both sexes are dimorphic pterygially.

(4) *vastatrix* Breddin: similar to *vitiensis*.

It has been supposed by Flor and Sahlberg that this polymorphism is caused by climatic influence. These authors believe that this inability to develop properly the tegmina and wings, does not exist embryonically in the egg, but depends on accidental conditions, such as the nourishment of the nymphs, and above all on the state of the climate during their development. Sahlberg adds that the feeble development of the organs of flight is altogether due to the greater development of the other organs of motion, i. e., the legs. Reuter believes, however, that the increase in number of polymorphic species as one proceeds northwards in Europe depends probably on many other causes, independent of climatic influence. Thus only eight species of Auchenorhynchi live in Lapland on trees or bushes, and these species are always monomorphic.

Reuter makes the following observations:

(1) Dimorphic forms are found even in the tropics.

(2) Short-winged individuals are observed most frequently among insects whose legs are well developed and constructed

for leaping or running very quickly; thus dimorphism is strongly represented among Orthoptera and Auchenorhynchous Siphonata; and indeed in the Miridae, the great part of the dimorphic species have thickened posterior legs, as is also the case with the femora in the Anthocoridae.

(3) There are a great number of instances where the female alone is dimorphic, but never a one where the male alone is so. In such cases the female very often has the femora more thickened than are those of the male—[among Heteropterous Miridae.]

(4) Most dimorphic species live on herbs or near the roots of such like.

(5) On the contrary, no dimorphic species live on trees or bushes.

(6) In some cases, dimorphism depends so obviously on the manner of living of the species that it cannot be caused by the climate, for example, in certain Myrmecophilous species.

(7) Not a single dimorphic species has been found among the numerous fossil Orthoptera and Hemiptera.

Reuter therefore concludes:

(1) The macropterous is the primitive form and the brachypterous forms are only produced in a more advanced period by "natural selection"; the existence of a macropterous form of a species usually brachypterous must be regarded as *reversion.*

(2) The reduction of the flight-organs is probably produced by diverse causes; in certain Myrmecophanous Miridae, it evidently depends on the manner of living of the species and "mimicry"; the Anthocorid *Myrmedobia coleoptrata* mimics *Alexia pilifera*, a little Coleopteron. [It should be noted however that many Formicicolous insects do not at all resemble their hosts or jailors.]

(3) Many species have lived in localities where they have not been obliged to resort to flight, because instead of trees and bushes they have lived on the ground or among herbs, thus using their legs more often. Consequently in successive generations, the latter are continually developed more strongly, while the muscles of flight by lack of usage are generally enfeebled and atrophied, the tegmina and wings thus becoming as much shortened as the legs are developed and thickened, by the law of "reciprocal influence."

(4) The male, as the active sex, has been obliged to avail himself of his organs of flight, and exercise his muscles; this is why this sex, in many species, has, by heredity, the tegmina and

wings developed, while the female is dimorphic and rarely macropterous.

Reuter divides polymorphic forms into two kinds—I reproduce his classification, but not his polysyllabic nomenclature:

(1 and 2) Trimorphic and dimorphic forms, the latter subdivided into

(a) Female only dimorphic, e. g. *Perkinsiella saccharicida.*

(aa) Both sexes dimorphic, divided into

(b) Male dimorphic in a different manner to the female, e. g. *Euidella speciosa.*

(bb) Sexes equally dimorphic, e. g. *Peregrinus maidis.*

Reuter further divides the forms according to degree of shortening, as follows:

(1) Brachypterous form has the tegmina either a little shorter than, the same length as, or a little longer than, the abdomen, and the apical cells most often moderately developed.

(2) Tegmina at least a third shorter than the abdomen, and much shorter than those of the macropterpus forms; apical cells short, obsolescent, or absent; wings rudimentary or wanting. This section contains the majority of forms.

The term brachypterous ranges through "*micropterous*" from "*brachypterous*" to "*apterous.*"

In comment on the above, it may be noted—

(1) That in the tropics there are certainly many dimorphic leaf-hoppers arboreal.

(2) There seems to be no difference, in leaf-hoppers, in the structure of the legs in different forms of the same species.

(3) Th effect of climate is very problematical, but it is likely that in the tropics, brachypterous forms appear in the colder season. As Perkins has well remarked:

"One point in connection with this flightless forms is worthy of notice. Although the insect has not been with us for study for a sufficiently long time for us to speak with certainty on the point, yet, so far, the worst attacks of leaf-hopper have always followed or been partly coincident with the production of these flightless females, that is to say during the colder months of the year, or in the early summer. In the course of my recent tour of investigation through Hamakua to Olaa, I did not find a single example of the short-winged form, while in the winter months from some plantations not less than fifty per cent of the adults sent were of this form. This fact and some observations that I have made on other Hawaiian species, lead me to

believe that the flightless leaf-hoppers are more prolific than the fully winged specimens."

In connection with this, it is worth noting that both in *Perkinsiella saccharicida* and *graminicida* e. g., the brachypterous females have distinctly larger and fatter abdomens which appear at least to contain many more ova.

(c) MATERNAL AFFECTION.

The maternal solicitude, which has rendered so celebrated certain Earwigs, Centipedes, Cimicidae, and other Arthropods, finds expression also in a Membracid, *Entylia sinuata*, the details of which have been related by Miss Murtfeldt. The remarkable point is that the hopper, usually so shy, leaping away at the first alarm, refused to move when touched, while guarding her offspring.

(d) STRIDULATION.

The Stridulation of the Cicadoidea was known to the Greeks, and doubtless was investigated by many a philosopher before Xenarchos. The other Auchenorhynchi have always been supposed to be silent; but *Perkinsiella saccharicida* has been distinctly, and often, heard to stridulate by the Entomologists of this station, though specially modified organs have not yet been discovered. As the tegmina, even in the brachypterous forms, are observed synchronously to jerk up and down, this may have some connection with the phenomenon.

(e) THE RELATIONS BETWEEN LEAF-HOPPERS AND ANTS.

The relations between ants and other insects are extremely complicated and little understood.

That herds of Aphidae are kept in temperate zones by ants, and tended in the most remarkable manner, is too well known to be further dwelt upon; in the tropics, where as a rule Aphidae are very rare, their place is taken by other insects, among them certain Coccidae (i. e., Mealybugs), Leaf-hoppers, etc. Spix and Martius, Beske, Lund, Hardwicke, Guilding, Swainson and Belt have recorded observations on this point, though they were doubted by Sharp. Green however, has recently reobserved the phenomenon in Ceylon. He says: "I have frequently watched the larvae of various species of *Centrotus* being assiduously attended by ants. The larvae are gregarious, usually frequenting the succulent shoots of plants, and have an extensile organ at

the extremity of the body, from which the coveted fluid is emitted. This organ is distinctly 3-segmented. The small terminal segment was of a crimson color; the penultmate segment black, with a broad white median band; and the basal segment (of the extensile part) white. When the insect is undisturbed this organ is withdrawn into the long conical segment which apparently terminates the body, but is extruded immediately upon application by the attendant ants."

Green calls this form a *Centrotus*, Buckton naming it *C. nectaris* but apparently it does not belong to that genus.

In Hawaii, although ants often kill considerable numbers of young *Perkinsiella*, on the other hand they appear to protect them from their enemies, at a later stage, so that they (the ants) can enjoy the honey dew excreted from the hoppers.

It may be noted that Goding states that species of *Tragopa* (a Membracid) live in the ground in the nests of the ants, while a curious new Issine, (*Myrmecophyrne formiceticola*) was discovered under a stone in an ants' nest by Mr. Perkins. Further, it has been known, and occasionally noted, that the remarkable Tetigoniophanous Fulgoroid *Tetigometra lacta* is found in similar situations to *Tragopa*.

SYSTEMATIC POSITION AND CLASSIFICATION OF LEAF-HOPPERS.

(a) SURVEY OF PREVIOUS SYSTEMS.

"Leaf-hopper" is a convenient, non-technical term to express the Auchenorhynchi, excluding the Cicadidae.*

As regards the structure of the mouth parts the components of the order Hemiptera (or Rhynchota) are perhaps the most isolated of true insects; they form two sub-orders, viz.: the *Heteroptera* (or "bugs" proper), and the *Siphonata* (or Homoptera), the latter embracing two well marked groups, *Auchenorhynchi* and *Sternorhynchi*, based on the method of articulation of the labium.

The former contains Cicadids and Leaf-hoppers; the latter, Lerpinsects, Plantlice, Scalebugs, etc. The Cicadidae are not included in the general term "Leaf-hoppers" and will not be noticed except for purposes of comparison, the Australian forms having recently been monographed by Goding and Froggatt.

The first systematic disposition of any noteworthiness was that of Stal (1858, Stettiner Ent. Zeit., XIX, 233), in which he recognizes 5 families, Fulgorina, Cercopina, Cicadina, Membracina and Jassina, differentiated as follows:

1. Middle coxae elongate, articulated remote from each other. Tegmina with tegulae .... (1) *Fulgorina*.

1a. Middle coxae, short, conical, approximate. Tegulae absent. .... 2.

2. Posterior coxae short, conical, not laterally dilated; tibiae cylindric. .... 3.

2a. Posterior coxae transverse, dilated up to the lateral marmargins of the sterna; tibiae (at least the posterior pair) angled. (4 and 5) *Membracina & Jassina*, distinguished by the generally relative difference in the shape of the genae, and the spinoseness of the femora, also the attachment of the head onto the prothorax, etc.

* The Chermoidea (Psyllidae) are "leaf-hoppers" in a sense, but belong to another group (Sternorhynchi), and are sometimes called popularly "Jumping Plant Lice."

3. Anterior femora unarmed, not thickened; scutellum moderate or small; an arolium (*empodium*) between the claws; 2 ocelli. ....(2) *Cercopina.*

3b. Anterior femora thickened, spinose beneath; scutellum very large; 3 ocelli; no arolia...............(3) *Cicadina.*

In 1866 Stal. reduced this to 4 families only, Stridulantia Cercopida, Jassida and Fulgorida. His three subfamilies of Cercopida are those recognized by later authors, but are not natural; his Jassida form 7 subfamilies of which 6 are Membracine while his Fulgorida are divided into 13 subfamilies.

I reproduce (translated) Stal's tables of Fulgoridae in their entirety, as I shall refer to them later in some detail.

I. Anal area of wings reticulate; keel separating frons from gena continued onto the sides of the clypeus. *Fulgorida* Stal.

II. Anal area very rarely reticulate, clypeus in this case convex, lacking lateral keels.

A. Posterior tibiae lacking an apical, mobile spur.

a. Frons wide, transverse or almost as long as wide, produced on each side into a distinct angle; anterior legs compressed, more or less dilated; anal area of wings sometimes reticulate. ....*Eurybrachydida* Stal.

aa. Lateral margins of the frons not angulate; legs mostly simple; anal area of wings never reticulate.

b. Clavus very rarely granulate, apex acuminate, rarely somewhat obtuse, distinctly closed, the two veins united far (or very far) from the apex (sometimes nevertheless after the middle) of the clavus; costa very rarely dilated; tegmina sometimes abbreviate or the clavus and corium fused.

c. Vena clavi (anal vein) not reaching the apex, running into the comissure near the apex; tegmina sometimes abbreviate or the clavus and corium fused, lateral margins of clypeus in this case keeled.

d. Frontal ocellus absent, lateral margins of clypeus always keeled or acute......................*Dictyophorida* Stal.

dd. Ocelli always three, one at the apex of the frons; frontal ocellus very rarely lacking, in this case the sides of the clypeus are convex, wanting a keel..........*Cixiida* Stal.

cc. Vena clavi continued to the very apex of the clavus or united near the apex with the claval suture; tegmina sometimes abbreviate or lacking veins or the clavus and corium fused, lateral margins of the clypeus in this case not carinate.

1. Head narrower than pronotum; sides of the clypeus keeled; last segment of rostrum elongate; pronotum angulately emarginate at the base; tegmina internally widened beyond the clavus; first segment of posterior tarsi elongate...... .... *Achilida* Stal.
2. Head narrower than pronotum; sides of the clypeus not carinate or with an obtuse keel; pronotum most usually angulately emarginate at the base, very rarely roundly sinuate, tricarinate, lateral keels diverging, most often reaching the base; commissure straight or rounded after the clavus, costa sometimes dilated, costal membrane transversely veined; first segment of posterior tarsi elongate... .... *Tropiduchida* Stal.
3. Head most often narrower than the pronotum; sides of the clypeus sometimes carinate; rostrum with the last segment short or very short; pronotum posteriorly angulately emarginate, not keeled or with one obsolescent one; costa simple; posterior tibiae most often unarmed, rarely spinose; first segment of posterior tarsi elongate. *Derbida* Stal.
4. Head narrower than pronotum, sides of clypeus keeled; rostrum short, thick, last segment very short; pronotum truncate basally, disk carinate or tuberculate; first segment of posterior tarsi strong, less long. .*Lophophida* Stal.
5. Head not or little narrower than pronotum; clypeus most often convex, lateral margins very rarely with a keel, pronotum truncate basally, rarely widely roundly sinuate, without a median keel or with an obsolescent one; scutellum short, rarely twice as long as the pronotum; tegmina coriaceous or subcorneous, rarely vitreous, very rarely flat, more or less convex, sometimes very much abbreviated; first segment of posterior tarsi short or mediocre, very rarely elongate............................... *Issida* Stal.
6. Head wide or very wide, sometimes somewhat narrower than the pronotum; sides of the pronotum most often lacking a keel; pronotum posteriorly roundly sinuate, lacking keels or with an obsolescent median one; scutellum very large, costa dilated, costal membrane transversely veined or reticulate; posterior tibiae spinose; first segment of posterior tarsi short or rather short........... *Ricaniida* Stal.
7. Head a little narrower than pronotum; clypeus lacking lateral keels; pronotum subtruncate at the base or lightly and widely roundly-sinuate, not keeled or obsolescently so; scutellum large, at least three times as long as pronotum; tegmina very greatly decumbent; posterior tibiae spineless. .... *Acanoniida* Stal.

bb. Clavus strewn with granules, apex sometimes subacute and closed, sometimes very obtuse and widely open, the two veins separated throughout their entire length or united near the apex; costa dilated, costal membrane transversely veined; claval suture distinct................*Flatida* Stal.

B. Posterior tibiae with a mobile spur at the apex.. *Delphacida* Stal.

The Cercopidae are divided by him as follows:

I. Anterior margin of pronotum straight; eyes equally long and wide..............................*Cercopida* Stal.

II. Anterior margin of pronotum rounded or angled; eyes most often transverse.

A. Scutellum flat, triangular.............*Aphrophorida* Stal.

B. Scutellum strongly elevated, compressed posteriorly, armed with a long apical spine.............*Machaerotida* Stal.

The Tetigoniidae were studied only very superficially by Stal.

In 1875 was commenced the posthumous publication of Fieber's "Cicadines d'Europe." In an analytical table he divided the European Auchenorhynchi into 8 families, Membracida, Cicadaea, Fulgorida, Cercopida, Ulopida, Paropida, Scarida and Jassida, the last four being part of the Jassida of other authors.

In 1888 Ashmead divided the Auchenorhynchi into 6 families: Cicadidae, Fulgoridae, Membracidae, Cercopidae, Bythoscopidae and Jassidae, and the next year separated the Fulgoridae into 6 subfamilies, Acanoniinae, Flatinae, Ricaniinae, Issinae, Caloscelinae, Dictiopharinae, the Cixiinae being further discerpted into Achilini, Tropiduchini, Derbini and Cixiini. This work was little more than a misleading adaptation of Stal, and was disfigured by many misprints in the rendering of previous generic names.

In 1890 appeared the most important work yet published on the classification of Homoptera; this was, however, presented in Danish and remained sealed to many workers till translated into English by the present writer (1903). Hansen founds his divisions on the characters especially of the antennae and legs, and recognizes four families, Stridulantia, Cercopidae, Jassidae (including Membracidae) and Fulgoridae. Hansen's table of families is now reproduced, from my translation, in its entirety and will be referred to in the course of this paper.

A. Second segment of peduncle of the antennae without sensory organs, flagellum with several or many foveae. Intermediate coxae with the intro-basal angles a little remote in

ter se; coxal abduction somewhat small. Metasternum either entirely chitinous, or with two median sized membranous areas. Posterior coxae mobile, trochantins apparent; posterior trochanters a little or not wider than the femora; a flexion only possible between trochanter and femur; posterior femora without a "yellow spot" on the upper surface. Pleura of third to eighth abdominal segments entirely located on the lower side, formed of a larger exterior chitinous plate, and of an interior narrower area, partly membranous or evanescent. First pair of abdominal spiracles placed either laterally or ventrally. Third to eighth pairs placed ventrally, looking downwards. Tegulae always absent.

a. Three ocelli.

Flagellum consisting of five (or four?) elongate segments; sensory foveae very numerous in the two basal segments of the flagellum (some even found in the other segments. Conspicuous part of the mesonotum very large. Anterior femora very different from the intermediate pair (always considerably incrassate.) No empodium. Second pair of abdominal spiracles placed in a transverse ventral furrow, looking anteriorly and medianly; third to seventh pairs placed in the sternites, not in the pleura. Stridular organ present in the male. Antennae always placed in deep pits in front of the eyes under the anterior margin of the vertex. Tegmina unarmed beneath. Anterior margin of the wings a little curved towards the base, unarmed. Metasternum entirely chitinous. Posterior scarcely wider than the intermediate coxae, never reaching to the lateral margin of the thorax. Posterior femora simple, posterior tibiae cylindrical.. ....1. *Stridulantia* (i. e. *Cicadidae*).

b. Ocelli two or none. Flagellum composed of either numerous segments, or of an inflated basal segment and a very slender "seta"; some sensory foveae present, never numerous. Conspicuous part of the mesonotum median-sized, or small or absent. Anterior femora scarcely different from the second pair (most often not incrassate.) A large empodium present. Second pair of abdominal spiracles placed laterally, looking exteriorly or partly upwards. Third to eighth pairs placed in the pleura. No stridular organ.

a.' Flagellum composed of a large subpyriform basal segment, and a very slender "seta"—generally subarticulate; basal segment with some sensory organs, "seta" without them. Tegmina with a carina towards the base on the lower surface. Anterior margin of wings towards the base with a triangular plate, which is furnished on the exterior margin with some hooks. Me-

tasternum somewhat long, with two medium sized membranous areas. Posterior coxae scarcely wider than the intermediate pair, not reaching to the lateral margin of the thorax.

Posterior femora towards the base on the upper surface with a wider transverse keel. Empodium thicker, beneath with two chitinous spinose strips, the free margin a little or scarcely emarginate. Eyes always placed on the vertex towards the base. Antennae always placed in deeper pits in front of the eyes under the anterior margin of the vertex. Intermediate coxae with a strong meracanthus. Posterior tibiate cylindrical, each with a single process, or with two conical larger processes on the outer surface.................................2. *Cercopidae.*

b. Flagellum always composed of numerous segments; basal part longer, formed either of some (2-6) segments, or transversely furcate furnished with some scattered sensory pits; distal part divided into many segments, at least in part. Tegmina beneath not carinate. Anterior margin of the wings without a triangular plate, sometimes somewhat convex. Metasternum short, entirely chitinous. Posterior coxae much wider than the intermediate pair, extending as far as to the lateral margin of the thorax. Posterior femora simple at the base. Empodium thinner beneath, without apparent chitinous spines; free margin profoundly incised medianly. Ocelli sometimes on the vertex, sometimes on the front, occasionally evanescent. Antennae usually inserted in front of the eyes, sometimes under the eyes Intermediate coxae somewhat rarely with a meracanthus. Posterior tibiae very often prismatic or foliaceous, very rarely almost cylindrical, generally seriately spinulose, very rarely unarmed. ....3. *Jassidae.*

B. Second segment of the peduncle with many or very many peculiar (composite) sensory organs; flagellum with a single larger sensory organ on the pyriform basal segment. Intermediate coxae with the intero-basal angles considerably or very distant inter se; coxal abduction well developed. Metasternum almost entirely membranous, and this thin cuticle is extended outwards to the lateral parts of the metatharox, which is inflected somewhat on the lower side of the body. Posterior coxae immobile, their exterior part coalesced with the metathorax; trochantins absent. Trochanters very much stouter than the posterior femora; both an abduction and flexion possible between trochanter and femur. Posterior femora with a "yellow spot" near the base on the upper surface. Pleura of the third to eighth segments largely or altogether situated laterally, either

altogether membranous, or with a large upper area in large part or altogether membranous, and a lower plate chitinous. First pair of abdominal spiracles situated dorsally within the exterior produced part of the metanotum. Third to eighth pairs situated essentially laterally, and in large part or altogether turning outwards.

Ocelli more rarely evanescent, more often two at the sides of the head in front of the antennae; sometimes a third ocellus is found on the lower margin of the front near the base of the clypeus.

Antennae inserted under the eyes; flagellum composed of a thicker basal segment and a very slender "seta," either articulate or altogether divided into numerous segments. Tegula almost always present. Empodium coalesced with the claws throughout a shorter distance, and at most through two-thirds of a length of the claws; free margin a little emarginate or simple. Second pair of abdominal spiracles dorsal, somewhat remote from the lateral margin........................4. *Fulgoridae.*

Two years later, Van Duzee considered that the North American Cicadina were composed of nine families, Cicadidae, Membracidae, Fulgoridae, Cercopidae, Ulopidae, Ledridae, Bythoscopidae, Tettigonidae and Jassidae, the last five being collected into a super-family, Jassoidea. The Tettigonidae were divided into Tettigonina and Gyponina; the Jassidae into Acocephalina, Jassina (Dorydini, Deltocephalini, Athysanini, Jassini and Cicadulini) and Typhlocybina.

I shall refer later, to Van Duzee's classification of the Jassoidea, so that I now reproduce the characters for reference. It should however be noted, in fairness to Van Duzee, that he expressly restricts his classification to the North American Fauna; at the same time, the main points of his scheme are largely in use.

Superfamily *Jassoidea.*

"Ocelli on the face below the anterior edge of the head. ....Family *Bythoscopidae.*

Ocelli on the disc of the vertex..........Family *Tettigonidae.*

Ocelli on or near the anterior edge of the head, or wanting. ....Family *Jassidae.*

Family *Tettigonidae.*

Front large, prominent, strongly convex, cheeks long and narrow, anterior edge of the head obtuse, or rounded. ....Subfamily *Tettigonida* Berg.

Front flat, or slightly convex; more or less impressed across the base beneath the prominent and acute, or rounded and overhanging anterior edge of the head; cheeks at least moderately expanded..........Subfamily *Gyponina* Stal.

Family *Jassidae*.

Ocelli placed superiorly close to the anterior edge of the head. ....Subfamily *Acocephalina*.

Ocelli on the anterior edge of the head, or wanting......(a.)

a. First sector of the elytra forked near its base, the inner branch generally united to the second sector by one or two transverse nervures, usually one or both branches of the first sector are again forked, forming two or three anti-apical areoles; supernumerary cell present in the wings; ocelli present........................Subfamily *Jassina*.

First sector of the elytra forked close to its base, thus forming apparently three sectors, which run straight and undivided to the angular nervures separating the four apical areoles; no transverse nervures between the first and second sectors; wings without a supernumerary cell; ocelli usually wanting.........................Subfamily *Typhlocybina*.

Tribes of the *Jassina*.

Anterior edge of the head thing and sharp, or more or less foliaceous. .... *Dorydini*.

Anterior edge of the head sometimes acute, but generally obtuse or rounded, never thin and foliaceous..........(a.)

a. Elytra with two transverse nervures between the first and second sectors of the corium...............*Deltocephalini*.

Elytra with but one transverse nervure between the first and second sectors of the corium....................(b).

b. Elytra without a series of antiapical areoles, or with but one formed by the forking of the outer branch of the first sector, vertex subquadrate, hind and lateral margins elevated, before feebly arcuated, with the edge strongly rounded, or produced and tumid before with an obtuse apex. ....*Jassini*.

Elytra with a series (generally three) of antiapical areoles.(c.)

c. Outer branch of the first sector of the elytra with two forks evident..................................*Athysanini*.

Outer branch of the first sector of the elytra with its outer fork obsolete, or nearly so; anterior edge of the head well rounded, vertex but little if at all longer on the middle than next the eye................................*Cicadulini*.

In 1895 Osborn announced his views on the Phylogeny of the Auchenorhynchi as follows:

"The other division (i. e. Auchenorhynchi) beginning with those forms which have the most generalized condition of wing venation and body structure, would commence with the Cicadidae and follow the ascending order which is given in the current systems. It is true that the Cicadidae are themselves a specialized group, particularly in the forms possessing musical organs, but in their approach to the Psyllidae in wing venation and structure of the head and thorax they seem on the whole to present more generalized characters than can be found in any of the other families of the Homoptera.

"The Membracidae, except in extremely specialized pronotum, are easily seen to be related to the Cicadidae and naturally take their position next to them. The Fulgoridae, while possessing specializations of the head, are in thoracic structure and venation more generalized than the remaining families, and while possessing many highly differentiated sub-groups, may very probably be interposed between the preceding families and the Jassoid division. The Cercopidae in development of scutellum and in texture of elytra, as well as in the specialization of the tibiae, show characters of rather high rank, and, if placed as subordinate to the Jassoidea, they must at least be considered as a branch of nearly equal or parallel rank. The Jassoidea, separable into Bythoscopidae and Jassidae proper, may, on the whole, be considered as the most highly organized of the series, and as somewhat equivalent branches, the Bythoscopidae being in some respects extremely specialized, while the Jassidae are subdivided into nearly equal branches, Jassinae and Tettigoninae."

(b) SYSTEM ADOPTED.

The following is the classification I adopt here for the Auchenorhynchi, showing also their position with regard to other Hemiptera, proceeding from the more primitive to the more specialized.

Group 1—*AUCHENORHYNCHI* Amyot & Serville.

Super-family 1—*CICADOIDEA.*

Family 1—CICADIDAE.

Super-family 2—*TETIGONIOIDEA.*

Family 1—TETIGONIIDAE (=super-family Jassoidea, Van Duzee.)

Sub-family 1—Tetigoniinae.
2—Iassinae.
3—Agalliinae.
4—Penthimiinae.
5—Eupteryginae.
6—Ledrinae.
7—Stenocotinae.
8—Kahavaluinae.
(9—Megophthalminae (?).)

Family 2 MEMBRACIDAE.
3 CERCOPIDAE.

Super-family 3—*FULGOROIDEA*.

Family 1—FULGORIDAE.

Sub-family 1—Cixiinae.
2—Dictyophorinae.
3—Fulgorinae.

Family 2—ASIRACIDAE (=subfam. Delphacida Stal.)
3—ACHILIDAE.
4—EUTROPISTIDAE (=Tropiduchida Stal.)
5—DERBIDAE.
6—LOPHOPIDAE.
7—ISSIDAE.

Sub-family 1—Issinae.
2—Eurybrachyinae.
3—Tetigometrinae.

Family 8—POEKILLOPTERIDAE.

Sub-family 1—Ricaniinae.
2—Poekillopterinae. (=Flatida Stal.)
3—Amphiscepinae (=Acanaloniida Stal.)

(Families 3-6 are probably conventional, as will be discussed later.)

Group 2—*STERNORHYNCHI* Am. & Serv.

Super-family 1—*CHERMOIDEA*.
2—*APHOIDEA*.
3—*ALEYRODOIDEA*.
4—*COCCOIDEA*.

The principal points that (largely following Hansen and opposing Osborn, Van Duzee and others) I wish to insist upon very firmly, are:

1. The low estate of the Cicadoidea *as a whole*.

2. The slight degree of specialization of the Tetigonioidea in almost every point.

3. The Membracidae are only Tetigonioidea, highly specialized as to the pronotum.

4. The high degree of specialization of the Fulgoroidea and their great differentiation in every way from the other superfamilies.

I especially mark the last heading, as Osborn, in particular, who has so extended a knowledge of the Homoptera, emphatically places the typical Tetigonioidea at the head of the Auchenorhynchi.

(c) THE OUTER FRAMEWORK OF LEAF-HOPPERS.

Before proceeding further with this inquiry, I propose to discuss some part of the outer framework of the leaf-hoppers, and I make no apology for doing this at some length because firstly, almost every second author uses a different horismology, and secondly, the only comparatively recent discussions (I have not taken into consideration Spinola's extensive "Essay on the Fulgoridae" which was published 66 years ago) on the value, for taxonomic purposes, as a whole, of various organs in the Homoptera, are those of Hansen and Osborn, the latter also being only too brief.

In Leaf-hoppers, the head appears to be composed of 2 main sclerites, the *epicranium* and the *clypeus*: at one time I thought it possible that the '*frons*' of authors might be really the clypeus of other orders, the '*clypeus*' really the labrum and the '*labrum*' really the *epipharynx*, but the fact that in typical Cixiinae, there is an ocellus at the apex of the 'frons' seems to dispose of this at once, at least no one has ever supposed that there could be an ocellus on the clypeus. The structure of the head-capsule (*epicranium*) is, and has always so far proved, enigmatical and very little help in its elucidation is obtainable from text books The horismology of Hemipterists is certainly not homologous with that of workers in other orders. In Fulgoroidea there are usually considered to be 3 conventional areas, viz: Vertex, frons and genae; (lorae and tempora being added in Tetigonioidea.) In other insects the vertex is that part of the head which is bounded anteriorly by an imaginary line when the insect is in a horizontal situation, the frons being the remainder, mediolongitudinally, as far as the clypeus; thus the extent of the vertex is purely conventional and depends upon the degree of declivity

of the head. In the Auchenorhynchi, the head is always more or less declivous and bent under; and *at*, or *near*, the angulation or midst of the rounding, there is almost always a transverse keel, or false suture; or on either side of an imaginary line, the quality of the sculpturing is different, so that as a rule it is practicable to consider that there are 2 nameable and distinguishable areas, which are called '*vertex*' and '*frons*', not, however, strictly homologous to the 'vertex' and 'frons' in other orders, though, like them, strictly terms of convenience and not designations of separate sclerites; that they really are one sclerite may, apart from embryological evidence, be inferred from the position of the ocelli,—in many Tetigonioidea the 2 ocelli are close to the base of the vertex—while in some Fulgoroidea, two are on the genae, an extra ocellus being present right on the apical margin of the frons.

It follows, therefore, that the vertex may be partly ventral, or contrariwise the frons may be partly dorsal. The first contingency occurs among the Agalliinae, where the ocelli are often found far on the ventral aspect of the head; the latter occurs in certain Fulgoroidea, in which the vertex is very short, (in many Fulgoroids in which the vertex and frons are confused, I suspect that the former is entirely absent, as in some, it is represented merely by a linear section,) and apparently also in some Cercopids. Van Duzee uses the term "face" to designate the ventral aspect of the head, including the ventral part of vertex, the frons, genae, etc. Stal occasionally seems to follow the practice of workers in other orders, but this author rarely explained his horismology and is frequently very obscure. Edwards distinguishes a 'forehead' between the crown (vertex) and face.

The frons is rarely anastomosed with the clypeus. Sometimes it is so, discally, being sometimes then sutured off laterally.

The genae are the lateral parts of the head, sometimes placed actually laterally (*Fulgoroidea*) or ventrolaterally (*Tetigonioidea*), and are usually separated from the frons and vertex by keels or false sutures. Owing to the peculiar structure of the head in the Fulgoroidea the tempora do not seem to be separable; in the Tetigonioidea they are usually seen as narrow strips extending from the antennal scrobes to the posterior margin of the front, sometimes onto the lateral parts of the vertex; they are very conspicuous in *Tartessus*. The lorae are two small plates usually more or less crescentiform, lying between the clypeus and the genae, separable from them by false sutures and present only in the Tetigonioidea; they correspond with the juga in certain He-

teroptera. In the Cercopidae there is often a falsely-sutured-off antero-median piece (resembling somewhat in *appearance* the Heteropterous *tylus*) which coalesces posteriorly with the disk of the vertex and anteriorly fuses more or less with the frons, though usually separated by a keel; whether this is really part of the vertex or is a part of the frons pushed up, is uncertain. In some Fulgoroidea (most Cixiinae) there are 3 ocelli, two in the usual Fulgoroid position (i. e. at the more or less flat sides of the head, close to the antennae) and one at the anterior margin of the frons, adjoining the clypeus. In the Tetigonioidea they may be almost anywhere on the vertex, sometimes close to the base, (Tetigoniinae etc.), sometimes near, or on, the anterior margin of the head (Iassinae etc.), sometimes again at the extreme apical margin of the vertex, close to the frons (Agalliinae.) In Stenocotinae & Kahavaluinae, they are situated at the bottom of elongate furrows on, or near, the anterior margin of the vertex. Often they are obviously functionless, though rudimentarily present, rarely entirely wanting. The work of the ocelli is enigmatical. In the Fulgoroidea, their position is practically uniform, though their usefulness must be sadly circumscribed by the surrounding elevated keels. It is evident that in the Tetigonioidea the position of the ocelli is of great importance for systematic purposes—for it is obvious that the directions and extent over which an insect can see, must influence its life very greatly. It is unnecessary to dwell on this subject, but it is evident that the visuality or light perception or whatever their use may be, must be very different in *Tetigonia* where the ocelli are placed on the disk of the vertex, near the base and turning a little outwards, to *Agallia* where they are far on the disk of the face; and sufficiently different in *Phrymomorphus* where they are small and flattish and placed on the smooth anterior margin of the vertex, to *Aphrodes* where they are near the anterior margin (but on the disk,) this genus being carinate anteriorly, the disk being a little sunk.

In his celebrated studies, Hansen has laid great stress, and rightly so, on the form of the antennae and on the structure of their sensory organs. I much regret that I have not had sufficient time to continue Hansen's researches very far, but I have done so sufficiently to convince myself of their great value. Their characteristics in the various super-families etc. are sufficiently displayed in Hansen's table, quoted previously.

Of the Thorax I need not speak, except to point out that while usually of ordinary structure in the Tetigonioidea (with the

exception of the remarkable Membracidae,) the pronotum is considerably modified in the Derbidae, and in very many Fulgoroidea is arched or rounded strongly anteriorly and most frequently more or less deeply emarginate posteriorly. The scutellum is nearly always 1-5 carinate in the Fulgoroidea, rarely carinate in the Tetigoniidae and Cercopidae. It should be noted that by "thorax," Stal means "pronotum" only.

In certain forms of Derbidae (*Philadelphcia* etc.,) in which the flight organs are very peculiar, the scutellum has lost its characteristic triangular shape, with sharply limited margins and has more the appearance of that sclerite in the Cicadoidea.

It is so difficult to be sure of seeing correctly the empodia of the tarsi, that I have omitted any notice of them.

The venation in Siphonata is very difficult to homologize with other orders; it can at least be done only by embryological studies. At the present time, the nomenclatures of Stal, Fieber, Edwards, Westwood, etc., are used somewhat indiscriminately and loosely. I have collated these and other systems as far as feasible (being guided largely by Comstock & Needham) and have drawn diagrams to show the venation of various types. In *Scolypopa australis*, a Fulgoroid of the subfamily Ricaniinae there are 8 veins given off by, or near, the basal cell of the corium, 5 from the apical margin (Nos. 3 to 7) and 3 from the base, or near it (Nos. 1, 2 and 8). In order they are costal, subcostal, radial, subradial, median, submedian, cubital, sutural. In the clavus there are two, viz.: anal and axillary. In most forms the subradial and submedian appear only as forkings of the radial and median.

The costal vein, *as a rule*, is present only near the base and is lost later on in the subcostal which is usually, except near the base, the marginal vein; in such a case the costal is usually not on a plane with the rest of the tegmen. In the Poekillopteridae and a few others, the costal vein is complete, though sometimes subobsolescent as a thick vein. In the Cicadoidea, the subcostal and radial (and largely the obsolescent costal) are fused more or less.

The three main veins proceeding from the apical margin of the basal cell appear always to be (from the exterior inwards), radial, median, cubital. These three are almost always easily recognizable, though in most Tetigonioids and Asiracids the first two have a somewhat long common stem, the medioradial; on the other hand, in Ricaniinae we have 5 veins, here adding a subradial and a submedian. The sutural vein appears some-

times on one side, sometimes on the other, of the claval suture and is of little account.

Synonymy of Venation in Tegmina of Leaf-hoppers.

1. *Costal.*
2. *Subcostal*=radius *Spinola*=costa (p) *of many authors.*
3. *Radial*=cubitus *Spinola*=mediastinal *Westwood.* =Upper branch of cubital *Sahlberg*=1st. sector *Fieber.*
4. *Subradial,* usually present as a fork of the radial, or entirely absent.
5. *Median*=1st. discodal *Spinola*=postcostal *Westwood.* =exterior branch of exterior ulnar *Stal.*=lower branch of cubital *Sahlberg*=2nd. sector *Fieber.*
6. *Submedian*=interior branch of exterior ulnar *Stal.*; usually present as a fork of the median.
7. *Cubital*=2nd. discoidal *Spinola*=median *Westwood.* =interior ulnar *Stal.*=3rd. sector *Fieber.* =brachial *Edwards.*
8. *Sutural*=postcubital *Spinola*=anal *Westwood*=1st. anal *C.* & *N.*
9. *Anal*=claval *Stal.*=2nd. anal *C.* & *N.*
10. *Axillary*=3rd. anal.

Cells (or Areas) of Tegmina.

1. *Costal* (often absent=costal membrane *Stal.*
b. *Subcostal*=costal cell Stal (p). In some forms where the costal vein is rudimentary, this is often termed the costal cell.
c. *Radial*=subcostal *Melichar, Edwards,* etc.
d. *Subradial.*
e. *Median*=basal *Edwards.*
f. *Submedian.*
g. *Cubital*=brachial *Edwards.*
h. *Basal* cell.

The marginal cells from the apex of the subcostal to the apex of the clavus, are called "apical cells"; basal of these to the basal cell, between the subcostal and the cubital, are the "discoidals," some of which may be "subapical" (or "anteapical").

Wings.

The relations of the wing-veins and cells are very obscure and they have been little used in classification, except as regards the presence of the submarginal vein and the supernumerary cell.

Four types are figured somewhat diagrammatically, viz., Tetigoniine, Eupterygine, Agalliine and Asiracid.

(1) *Costal*, absent or merged.
(2) *Subcostal.*
(3) *Radial*=first sector *Fieber*=costal *Signoret.*
(4) *Median*=second sector *Fieber* =upper radial *Signoret.*.
(5) *Cubital*=third sector *Fieber*=lower radial *Signoret.*.
(6) *First anal*=Radiating nerves *Fieber.*
(7) *Second anal.*
[The Claval suture (pliant suture *Fieber*) usually comes here.]
(8) *Axillary*, or third anal=Claval.
(9) *Submarginal*=peripheric nervure *Fieber.*

The only cell necessary to specify is

(a) *Supernumerary cell*, often absent; it is formed by the forking of the radial.

It is unnecessary to dilate on the legs. As the popular name implies, they are saltatorial in construction, and so great is the velocity of the leap in some forms (*Oncometopia* and other Tetigoniinae) that they have gained the name of "Sharpshooters."

In the Asiracidae, one of the spines which fringe the apex of the tibiae, has in each posterior pair, become greatly enlarged, often enormously so, and mobile, being set with "teeth" on its outer edge; this is very characteristic of all instars. Curiously enough, the Asiracidae are by no means the champion jumpers, being surpassed both in length of leap and in velocity, by Tetigonioids and Fulgoroids of less leg development and destitute of a mobile spur.

It seems necessary to state that the "apex" or "apical margin" of any section, is that part of it farthest from the junction of thorax and abdomen; contrariwise, the "base" or "basalmargin" is the part nearest. Most authors erroneously speak of the basal angle of the scutellum as its apex; to avoid confusion, it is better to refer to it as the "posterior angle." Further, the part of the frons adjoining the clpeus is its apical margin and the top of the head is (typically) the base of the frons and apical margin of the vertex.

(d) CRITICISM OF PREVIOUS SYSTEMS.

After this short and very imperfect survey of the external structure and the life history of the leaf-hoppers, I propose to comment very briefly on the lines of classification laid down by the Masters in Hemiptera, cited near the beginning of this paper.

Unfortunately, owing to my almost entire lack of material for comparison,* I have been unable to accomplish much in the way of constructive criticism. These notes are solely intended to show how previous work must perhaps be modified in the light of this fresh material from countries so little known (as regards the Auchenorchynchi) as Eastern Australia and Viti.

And what an extraordinarily rich fauna of Leaf-hoppers there must be in Australia and the Southern Polynesian Islands! Messrs. Koebele and Perkins collected but a few months at the worst season of the year in the very places that an Entomologist, not collecting for such an economic purpose, would avoid on account of their barrenness.

Yet, these few months have produced nearly 500 species, almost all new. It is probably not too much to say that the Australian Region (in the widest extent of the name) is supporting today a leaf-hopper fauna of 10,000 species. It must be especially rich in Derbidae, Achilidae, Tetigoniidae, etc.

The region moreover demands the attention of Hemipterists, since it appears to possess the oldest existing fauna in the world. It is well known that the classification in all other orders of insects had to be considerably modified when the Australian fauna began to be worked out, and it will certainly be the case also with the Hemiptera. Goding and Froggatt have recently tackled the work in earnest, and it is to be hoped that extensive collections will be reaped before it is too late.

I must maintain the four leading points enunciated on p. 296 as being established by a study of the imago and of the nymphal instars in every detail of structure.

(1) The highly sensorized condition of the antennae in the adult and of almost the whole body of the nymphal instars, the presence of tegulae, the remarkable carination of the head and nota, and the disposition of the parts of the former, the richly

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* I am indebted to my colleague, Mr. O. H. Swezey, for allowing me access to his collections of Ohio Fulgoroids, and to my friend Mr. E. P. Van Duzee for several examples of Tetigonioid and Asiracid genera; to Mr. Ballou for *Stenocranus saccharivora*; and to Dr. Melichar for a few Sinhalese forms; otherwise beyond my own collectings, I have been compelled to rely on the written word.

variegated and harmonious colouring in many instances, and the diversity of cephalic form, seem indubitably to point to the pre-eminence and isolation of the Fulgoroidea. It is also worthy of notice that (as pointed out in Part I of this Bulletin) their Dryinid parasites are of a higher estate than those of the Tetigonioidea.

(2) Contrariwise, the humble condition of the last named, proved by their imperfectly sensorized state, both in adults and nymphs; the absence of tegulae, the (usually) smooth, plebeian head of feeble differentiation, and the (usually) dull coloring. The only exceptions almost are the Membracidae, highly specialized and diversified in their prothoracic structure, nevertheless lowly as a whole; the often gaudily colored Cercopidae, which also have remarkable nymphal habits, and a few Tetigoniid forms such as *Stenocotis* and *Kahavalu*.

(3) The Cicadoidea, highly specialized in one direction, are as a whole very low.

(4) The Membracidae are fundamentally, as shown by Hansen, essentially Tetigonioid.

With regard to the subdivision of the families I regret that lack of time prevents my lingering long.

(1). *Stal's Classification of the Fulgoroidea.*

There is no doubt that Hansen's divisions by the characters of the antennae, are sound; at the same time, especially when dealing with novel uniques, it is often exceedingly difficult to determine just what is the form of the antennal sensory organs. I think the following are natural divisions:

(1) *Fulgoridae*, with subfamilies Fulgorinae, Dictyophorinae and Cixiinae, corresponding to Stal's Fulgorida, Dictyopharida and Cixiida; at the same time it is difficult to separate the last two, except by general facies.

(2) *Poekillopteridae*, with subfamilies Ricaniinae, Poekilloptcrinae and Amphiscepinae, corresponding to Stal's Ricaniida, Flatida and Acanoniida.

(3) *Issidae*, with subfamilies Issinae, Eurybrachyinae, and Tetigometrinae, corresponding to Stal's Issida and Eurybrachydida. Stal separates these widely, but I think their closely allied nature is established; the Issinae, via *Amphiscepa*, come very close to the Poekillopteridae. The Tetigometrinae should perhaps even form a family by themselves. They do not, I think, establish any link between the Fulgoroidea and Tetigonioidea, but, on the contrary, are very highly modified.

(4) We now have a heterogeneous mass, which I temporarily rank into families, viz., Achilidae, Eutropistidae, Derbidae and Lophopidae. These are almost certainly artificial. The character that separates them from the Fulgoridae is that the anal vein of the clavus runs into the commissure in the latter, while it runs into the apex of the clavus in the four families mentioned just before. This may seem a trivial character, but it was insisted upon by Stal, and is certainly correlated with other good characters; unfortunately in Achilidae and Eutropistidae, it is difficult to determine the character of the antennal sensory organs, though in some of the latter, they seem Fulgorid. Although laid down by Stal, he himself has erred in assigning certain genera correctly, as have Melichar and other authors, for instance *Lamenia* is certainly not a Derbid, though it might be an Achilid were it not for the claval venation. I have placed it temporarily in the Cixiinae, where it perhaps looks uncomfortable. Ashmead and Swezey locate it in the Poekillopterinae, but the clavus shows no trace of granulation and the venation is of a different type.

Many of the Eutropistidae have a close resemblance to Dictyophorinae but, as I believe, this is false. In the former, the costal vein is present in its entirety, and the costal cell is multivenose transversely; in the latter, the costal vein is short, merging in the subcostal, and the subcostal cell (which is the marginal) is plain.*

The Derbidae are most probably a mixture; the typical forms have a plain clavus, but the majority have the anal vein very strongly sensorized; here too are some of the most extraordinary antennae in the Homoptera.

The only conclusion to be gained from a consideration of the Australian Fulgoroidea is that they need a great deal more study, especially on the venation and antennae, and more especially on the earlier stages.

(2) *Van Duzee's classification of Tetigoniidae (his Jassoidea).*

(1) I do not think, after studying *Tartessus* and allied genera, that the "Bythoscopidae" really form even a subfamily; indeed it is very difficult to draw sharp lines of distinction all through

* My recently published *Peggioga formosa* (the manuscript, however, finished in 1903) from Lefu, is stated to be allied to *Dictyophora*; it is, however, probably an Eutropistid. I have no specimens here for re-examination. *Astorga* also, although placed in the Dictyophorinae, has a well-developed costal vein.

the Tetigoniidae. The family seems discerptible somewhat on the following lines:

Iassinae, Penthimiinae, Tetigoniinae, Agalliinae	Eupteryginae	Stenocotinae, Ledrinae
Kahavaluinae, ? Megophthalminae		Ulopinae (? Membracidae)

The Penthimiinae, Tetigoniinae, Agalliinae and Eupteryginae being all derived from Iassinae by various routes; Stenocotinae from the same via perhaps *Tartessus* or allied form; Ledrinae possibly from *Dorycephalus* or allied forms.*

Although convenient for grouping the North American forms, Van Duzee's results do not seem to me to be natural.

The most primitive known form would seem to be some ally of *Phrynomorphus*; from this there are many evident offshoots. For example through *Thamnotettix* we arrive at *Metriosteles* and its allies without any break, so that Van Duzee's "*Cicadulini*" are difficult to define sharply for a world fauna. The Eupterygine series would seem to be a logical continuation, the tegmina and wings being greatly and increasingly degraded; in all known forms but one, the radial, median, and cubital veins reach the apical cells without forking en route, and the venation is usually so degraded that it is difficult or impossible to trace the basal half of these veins at all. The discovery of *Aneono*, undoubtedly an Eupterygine, shows the more primitive forking of the medioradial (which unite again towards the apex) and displays the untenability of deriving the Eupteryginae from the Macrostelines.

The separation of the "Dorydini" is not I think scientific; elongation of the head springs up independently manywhere; for example *Phrynophyes* and *Giffardia* from *Phrynomorphus*; *Hecalus* and its allies from *Thomsonia* or allies; *Cephalelus* from near *Dorycephalus* which arises elsewhere.

The value of the transverse vein near the base of the tegmen between the radial and median veins was hotly criticized by Osborn and Ball, who denied it even specific value, but I have seen no public retraction by Van Duzee. The following groups seem more or less well circumscribed:

(1) *Iassinae*, corresponding to the Jassina of Van Duzee, a

* It is possible, especially after a consideration of the nymphs, that the Stenocotinae are an offshoot from the Ledrinae.

huge heterogenous group, drifting into the Agalliinae via *Tartessus* and *Epithalamium*, and into the Tetigoniinae via *Macroceratogonia.*

(2) *Acocephalina* of Van Duzee (not the Acocephalidae of Edwards) should, I think, be included in the above; or if not, they would be separable* by the dorsal position of the ocelli, the degeneration of the organs of flight appearing of comparatively little account. *Eupelix* I would place here, but *Platymetopius* and its allies are certainly *Phrynomorphinae.*

(3) *Eupteryginae*, despite *Aneono*, are a well marked group.

(4) *Penthimiinae* (Gyponina of Van Duzee) have very little to do with the Tetigoniinae except that the ocelli are dorsal.

(5) *Tetigoniinae* correspond to the Tettigonida of Van Duzee; they probably include the curious *Macroceratogonia.*

(6) *Agalliinae* (Bythoscopida, Van Duzee) are difficult, as I have said before, to separate sharply from Iassinae.

(7) *Ledrinae* are well marked, but have something of the appearance of *Dorycephalus*, except that the ocelli are dorsal; *Ledra* is an extreme form.

(8) *Stenocotinae* are exclusively Australian, allied to Ledrinae but the ocelli are placed in separate grooves on the top of the rather thin head.

(9) *Kahavaluinae*, monotypical, strongly recalling certain membracine characters, ocelli placed somewhat as in Stenocotinae, but head not thin. Legs very feebly bristly.

(10) The *Megophthalminae* are possibly to be placed here.

(11) The *Ulopinae* are probably membracid.

(3) *Osborn's views on Phylogeny.*

I cannot conceive on what grounds the learned Professor considers the Tetigoniidae to be so highly organized. He instances the structure of the pronotum, head, scutellum and tibiae, etc., in the other families, but is silent as regards the special virtues of the Jassids.

To me the Tetigoniidae (and especially *Phrynomorphus, Deltocephalus*, etc.), seem far the most primitive of Leaf-hoppers. Their head, thorax, legs and genital segments seem to be of the most ordinary, common type that one could find in the larger orders of Insecta. The tegmina and wings are also very simple, though this is perhaps the simplicity of degradation.

* Under the name of Aphrodinae.

The Membracidae are little related to the Cicadidae, except perhaps more or less superficially in venation and are closely allied to the Tetigoniidae in all essentials; they have however acquired a perpendicularly situated vertex and a remarkably specialized pronotum.

What Osborn means by special development of scutellum in Cercopidae, I do not know, as this is far more highly developed in size, presence of keels, etc., in many Fulgoroids. The Cercopidae are plainly Jassoids specialized in the direction of degradation of flight organs, etc., but with more complicated genitalia.

It is the Fulgoroids which are certainly far and away ahead of all the other Auchenorhynchi. In the adult state and far more so in the nymphal instars, the average Fulgoroid is a mass of sensory organs. The antennae are crowded with them (*Swezeyia* and *Phantasmatocera* in particular) and of very high degree of special organization. (In the other superfamilies they are sparse, minute, and of a simple character.)

The vertex in some adult forms (Achilidae, Derbidae, etc.), is throng with them (much more so in the nymphs). In the nymphs the nota are also crowded with them, and the tegmina in the adults, along the veins. Some Tetigonioids have granulate tegminal veins, but this is very common in, e. g., many Cixiinae in the Fulgoroids, while the anal vein of the clavus in most Derbidae is crowded with them. In Poekillopterinae, the clavus, on veins and in between, is throng, characteristically of the subfamily, with granulations, though these latter may not be sensory; in this subfamily, the tegmina are often very minutely and closely granulate in between the reticulations.

The pronotum, contrary to Osborn's opinion, is specialized in Achilidae, Derbidae, etc., in a way not reached even in *Stenocotis* among the Tetigoniidae. (Of course the Membracidae are excepted in this.)

In the other superfamilies, the head is of a most ordinary description, the ocelli placed, either dorsally or ventrally, somewhere on the vertex between the eyes; in the Stenocotinae and *Kahavalu*, they are in little grooves on the anterior margin of the head. In the Fulgoroidea the head is almost always remarkably keeled, there seeming in some forms to be a keel wherever one can be placed; the side of the head is flattened and it is there that the ocelli are placed, close to the eyes and antennae. Finally, the genitalia are very much the most specialized in the Fulgoroidea.

In the discussion on Osborn's paper, Ashmead briefly presented his views; he is certainly more correct in his order of Cicadidae, Jassidae, Membracidae, Fulgoridae (he omits Cercopidae), but he derives these from the Sternorhynchi, believing that the Coccidae are the lowest, root-stock!

(4) *Summary.*

(1) The Fulgoroidea are enormously the most specialized, highly organized and differentiated, of the Auchenorhynchi, the Cixiinae possibly being the most primitive types, though in some respects the Derbidae are:

(2) The most primitive existing forms of Siphonata seem to be the Cicadoidea, but

(3) The Tetigonioidea seem to have arisen separately.

(4) Of the Tetigonioidea the *Phrynomorphus* forms seem to be the most generalized; Agalliinae are specialized a little in the extreme declivity of the vertex and frons, and ventral position of the ocelli; they also tend to spinoseness of the tibiae, culminating in the Cercopiform Eurymelini.

(5) The Membracidae are highly specialized in the pronotum, but are otherwise very low.

(6) The Cercopidae are perhaps as a whole the culmination of the Tetigoniioidea.

LIST OF NEW GENERA AND SPECIES COLLECTED BY KOEBELE AND PERKINS IN QUEENSLAND, NEW SOUTH WALES AND VITI.

Fam. Tetigoniidae. (Australian Species.)

1. *Tetigonia koebelei* sp. nov.
2. *T. pasiphae* sp. nov.
3. *T. parthaon* sp. nov.
4. *T. pettimolua* sp. nov.
5. *T. anemolua* sp. nov.
6. *Macroceratogonia* gen. nov., *aurea* sp. nov.
7. *Thaira* gen. nov., *labena* sp. nov.
8. *Phrynomorphus longuinquus* sp. nov.
9. *P. taedius* sp. nov.
10. *P. fatigandus* sp. nov.
11. *Phrynophyes* gen. nov., *phrynophyes* sp. nov.
12. *P. parvula* sp. nov.
13. *Anemolua* gen. nov., *hanuala* sp. nov.
14. *Anemochrea* gen nov., *mitis* sp. nov.
15. *Deltocephalus* (?) *perparvus* sp. nov
16. *Nephotettix plebeius* sp. nov.
17. *N. contemptus* sp. nov
18. *Scaphoideus pristidens* sp. nov.
19. *Euleimonios* gen. nov., *demittendus* sp. nov.
20. *Kosmiopelex* gen. nov., *varicolor* sp. nov.
21. *Dryadomorpha* gen. nov., *pallida* sp. nov.
22. *Giffardia* gen. nov., *dolichocephala* sp. nov.
23. *Hecalus immaculatus* sp. nov.
24. *Paradorydium menalus* sp. nov.
25. *P. pseudolyricen* sp. nov.
26. *Dorycephalus ianthe* sp. nov.
27. *D. subreticulatus* sp. nov.
28. *D. trilineatus* sp nov.
29. *Tartessus syrtidis* sp. nov.

29a. *Myrmecophryne* gen. nov., *formiceticola* sp. nov.

30. *Pettya* gen. nov., *anemolua* sp. nov.
31. *Nesosteles* gen. nov., *glauca* sp. nov.

32. *N. sanguinescens* sp. nov.
33. *N.sordidior* sp. nov.
34. *N. taedia* sp. nov.
35. *Thaumatoscopus* gen. nov. *galeatus* sp. nov.
36. *Vulturnus* gen. nov., *vulturnus* sp. noc.
37. *Ectopiocephalus* gen. nov., *vanduzeei* sp. nov.
38. *Epipsychidion* gen. nov., *epipyropis* sp. nov.
39. *Eurinoscopus* gen. nov., *lentiginosus* sp. nov.
40. *E. sontiates* sp. nov.
41. *E. soboles* sp. nov.
42. *E. dryas* sp. nov
43. *E. pelias* sp. nov.
44. *E. molestia* sp. nov.
45. *E. pelamys* sp. nov.
46. *Pedioscopus* gen. nov., *philenor* sp. nov.
47. *P. polydoros* sp. nov.
48. *P. agenor* sp. nov.
49. *Ipo* gen. nov., *ambita* sp. nov.
50. *I. conferta* sp. nov.
51. *I. honiala* sp. nov.
52. *I. aegrota* sp. nov.
53. *Idiocerus ipo* sp. nov.
54. *Eurymeloides hyacinthus* sp. nov.
55. *E. cumulosus* sp. nov.
56. *E. bicinctellus* sp. nov.
57. *E. ornatus* sp. nov.
58. *E. rubrivenosus* sp. nov.
59. *E. lentiginosus* sp. nov.
60. *Eurymela rubrolimbata* sp. nov.
61. *E. plebeia* sp. nov.
62. *E.lubra* sp. nov.
63. *Aneono* gen. nov., *pulcherrima* sp. nov.
64. *Kahaono* gen. nov., *hanuala* sp. nov.
65. *Dikraneura* gen. nov., *honiala* sp. nov.
66. *D. aneala* sp. nov.
67. *Cicadula histrionicula* sp. nov.
68. *Eupteryx haematoptilus* sp. nov.
69. *Empoa australensis* sp. nov.
70. *Erythroneura melanogaster* sp. nov.
71. *E. lubra* sp. nov.
72. *E. honiloa* sp. nov.
73. *E. ipoloa* sp. nov.
74. *E. honiala* sp. nov.
75. *Rhotidus ingens* sp. nov.

76. *R. informis* sp. nov.
77. *R. flavomaculatus* sp. nov.
78. *R. monstrum* sp. nov.
79. *R. ledropsiformis* sp. nov.
80. *R. horrendus* sp. nov.
81. *R. viridescens* sp. nov.
82. *Smicrocotis* gen. nov., *obscura* sp. nov.
83. *Kyphocotis* gen. nov., *tessellata* sp. nov.
84. *Kahavalu* gen. nov., *gemma* sp. nov.

(Vitian Species.)

85. *Nesosteles* gen. nov., *hebe* sp. nov.
86. *Cicadula vitiensis* sp. nov.

Fam. Membracidae (Australian).

87. *Gelastorrhachis* gen. nov., *diadema* sp. nov.
88. *G. clavata* sp. nov.
89. *Sarantus nobilis* sp. nov.
90. *Sextius assimilis* sp. nov.
91. *S. longinotum* sp. nov.
92. *S. kurandae* sp. nov.
93. *Acanthuchus dromedarius* sp. nov.
94. *A. obtusus* sp. nov.
95. *Centrotypus hospes* sp. nov.

Fam. Cercopidae (Australian).

96. *Euryaulax* gen. nov., *callitettigoides* sp. nov.
97. *Aufidellus* gen. nov., *australensis* sp. nov.
98. *Aufiterna* gen. nov., *ptycloides* sp. nov.
99. *Petyllis* gen. nov., *australensis* sp. nov.
100. *Eurycercopis* gen. nov., *nigrofasciata* sp. nov.
101. *Polychaetophyes* gen. nov., *serpulidia* sp. nov.
102. *P. aequalior* sp. nov.
103. *Pectinariophyes* gen. nov., *pectinaria* sp. nov.
104. *Anyllis* gen. nov., *leiala* sp. nov.

Fam. Fulgoridae (Australian).

105. *Eurystheus perkinsi* sp. nov.
106. *Eurinopsyche* gen. nov., (type *obscurata* Fabr.)
107. *Thanatodictya* gen. nov., (type *praeferrata* Distant)

108. *Lucinda* subgen. nov., *lucindae* sp. nov.
109. *Niculda* subgen. nov., *anadyomene* sp. nov.
110. *T.* (*N.*) *hebe* sp. nov.
111. *T.* (*N.*) *psyche* sp. nov.
112. *Hasta* gen. nov., *hastata* sp. nov.
113. *H. paupera* sp. nov.
114. *Astorga* gen. nov., *saccharicida* sp. nov.
115. *Solonaima* gen. nov., *solonaima* sp. nov.
116. *Oliarus laertes* sp. nov.
117. *O. kampaspe* sp. nov.
118. *O. talunia* sp. nov.
119. *O. asaica* sp. nov.
120. *O. felis* sp. nov.
121. *O. alexanor* sp. nov.
122. *O. lubra* sp. nov.
123. *O. sponsa* sp. nov.
124. *O. phelia* sp. nov.
125. *Carolus* gen. nov., *crispus* sp. nov.
126. *Gelastocephalus* gen. nov., *ornithoides* sp. nov.
127. *Calamister* gen. nov., *obscurus* sp. nov.
128. *Lamenia kulia* sp. nov.
129. *L. hiva* sp. nov.
130. *Perkinsiella graminicida* sp. nov.
131. *Phacalastor* gen. nov., *pseudomaidis* sp. nov. (and
132. *P. koebelei* sp. nov.
133. *Stenocranus agamopsyche* sp. nov.
134. *Hadeodelphax* gen. nov., *pluto* sp. nov.
135. *Gelastodelphax* gen. nov., *histrionicus* sp. nvo.
136. *Smicrotatodelphax* gen. nov., *perkinsi* sp. nov.
137. *Ectopiopterygodelphax* gen. nov., *eximius* sp. nov.

(Vitian species.)

138. *Perkinsiella vitiensis* sp. nov.

(See also No. 131.)

Fam. Eutropistidae (Australian).

139. *Ossa venusta* sp. nov.
140. *O. formosa* sp. nov.
141. *Peltodictya* gen. nov., *kurandae* sp. nov.
142. *Rhinodictya* gen. nov., *quaesitrix* sp. nov.

(Vitian).

143. *Vanua* gen. nov., *vitiensis* sp. nov.

Fam. Achilidae (Australian).

144. *Aristyllis* gen. nov., *aristyllis* sp. nov.
145. *A. omphale* sp. nov.
146. *A. adippe* sp. nov.
147. *Benella* gen. nov., *aliena* sp. nov.
148. *Pyrrhyllis* gen. nov., *pyrrhyllis* sp. nov.
149. *Majella* gen. nov., *majella* sp. nov.
150. *Phenelia* gen. nov., *elidipteroides* sp. nov.
151. *Eurynomeus* gen. nov., *australiae* sp. nov.
152. *Argeleusa* gen. nov., *kurandae* sp. nov.
153. *Cythna* gen. nov., *laon* sp. nov.
154. *Salemina* gen. nov., *francescophila*, sp. nov.
155. *Francesca* gen. nov., *Saleminophila* sp. nov.
156. *Ancipo* gen. nov., *diva* sp. nov.

Fam. Derbidae (Australian.)

157. *Nisia grandiceps* sp. nov.
158. *Phaconeura froggatti* sp. nov.
159. *P. pallida* sp. nov.
160. *Basileocephalus* gen. nov., *thaumatonotus* sp. nov.
161. *Thyrocephalus* gen. nov., *leucopterus* sp. nov.
162. *Phantasmatocera* gen. nov., *arborea* sp. nov.
163. *Heronax* gen. nov., *parnassius* sp. nov.
164. *H. saccharivora* sp. nov.
165. *Philadelpheia* gen. nov., *pandani* sp. nov.
166. *Sardis* gen. nov., (type *maculosa*.)
167. *Kaha* gen. nov., *perfecta* sp .nov.
168. *Rhotana chrysonoe* sp. nov.
169. *R. haematoneura* sp. nov.

(Vitian.)

170. *Suva* gen. nov., *koebelei* sp. nov.
171. *Phaciocephalus* gen. nov., *vitiensis* sp. nov.
172. *Swezeyia* gen. nov., *lyricen* sp. nov.
173. *Phantasmatocera* gen. nov., *vitiensis* sp. nov.
174. *Levu* gen. nov., *vitiensis* sp. nov.
175. *Pyrrhoneura* gen. nov., *saccharicida* sp. nov.

Fam. Issidae (Australian.)

176. *Issus vulturnus* sp. nov.
177. *I. sidnicus* sp. nov.

178. *I. ridicularius* sp. nov.
179. *I. elongatulus* sp. nov.
180. *Lollius* gen nov., *angustifrons* sp. nov.
181. *L. acutipennis* sp. nov.
182. *Samus lucindae* sp. nov.
183. *Lipocallia* gen. nov., *australensis* sp. nov.
184. *Gelastissus* gen. nov, *albolineatus* sp. nov.
185. *G. histrionicus* sp. nov.
186. *G. suffusus* sp. nov.
187. *Platybrachys oculata* sp. nov.
188. *P. chlorocephala* sp. nov.
189. *Olonia picea* sp. nov.
190. *Dardus immaculatus* sp. nov.
191. *Euronotobrachys* gen. nov., *arcuata* sp. nov.
192. *E. plana* sp. nov.
193. *Gelastopsis* gen. nov., *insignis* sp. nov.

Fam. Poekillopteridae (Australian.)

194. *Siphanta galeata* sp. nov.
195. *S. acutipennis* sp. nov.
196. *S. breviceps* sp. nov.
197. *S. toga* sp. nov.
198. *S. lucindae* sp. nov.
199. *S. subgranulosa* sp. nov.
200. *S. granulata* sp. nov.
201. *S. sidnica* sp. nov.
202. *Euryphantia* gen. nov., *cinerascens* sp. nov.
203. *Sephena rubida* sp. nov.
204. *S. hyacintha* sp. nov.
205. *S. cinerea* sp. nov.
206. *S. argus* sp. nov.
207. *Jamella* gen. nov., *australiae* sp. nov.
208. *Massila walkeri* sp. nov.
209. *M. sidnica* sp. nov.
210. *Mimophantia australensis* sp. nov.
211. *Aphanophantia* gen. nov., *cuscuticida* sp. nov.
212. *Scolypopa kurandae* sp. nov.
213. *Epithalamium* gen. nov., *aziola* sp. nov.

The following new specific names are also propos dentally:

Eupteryx melichari for *picta* Mel.
Aglena ornatula for *ornata* Walker.

LIST OF PREVIOUSLY KNOWN SPECIES COLLECTED BY KOEBELE AND PERKINS SO FAR AS WORKED OUT.

Family Tetigoniidae.

214. See 29a.
215. *Tetigonia albida* (Walker).
216. *Eutettix sellata* (Uhler).
217. *Nephotettix nigropicta* (Stal).
218. *Thomsonia arcuatus* (Motshulsky).
219. *T. lineolatus* (Motshulsky).
220. *T. kirschbaumii* (Stal).
221. *Cephalelus brunneus* (Waterhouse).
222. *Stenocotis planiuscula* (Stal).

Fam. Membracidae.

223. *Zanophara* (?) *tasmaniae* (Fairmaire).
224. *Z.* (?) *vitta* (Walker).
225. *Terentius convexus* (Stal).
226. *Dingkana borealis* (Goding).
227. *Sextius bipunctata* (Fabricius).
228. *S. virescens* (Fairmaire).

Fam. Cercopidae.

229. *Philagra parva* (Donovan).

Fam. Fulgoridae.

230. *Eurinopsyche obscurata* (Fabricius).
231. *Desudaba danae* (Gerstaecker).
232. *Thanatodictya praeferrata* (Distant).

Fam. Asiracidae.

233. *Perkinsiella saccharicida* Kirkaldy.
234. *Peregrinus maidis* (Ashmead).

Fam. Derbidae.

235. *Nisia atrovenosus* (Lethierry).
236. *Sardis maculosa* (Krueger).

Fam. Issidae.

237. *Platybrachys sicca* (Walker).
238. *Dardus abbreviata* (Guerin).

Fam. Poekillopteridae.

239. *Privesa aphrophoroides* (Walker).
240. *Scolypopa australis* (Walker).
241. *Gaetulia chrysopoides* (Walker).
242. *Neomelicharia furtiva* (Melichar).
243. *Siphanta acuta* (Walker).
244. *S. granulicollis* (Stal).
245. *Colgar peracuta* (Melichar).

DESCRIPTIONS OF GENERA AND SPECIES, ETC.

Of the localities investigated by Messrs. Koebele and Perkins, or otherwise referred to;

Cairns is on the coast of northeast Queensland, at the south end of Trinity Bay;

Redlynch, Nelson and *Kuranda* are more or less unimportant places nearby, the *Baron* River flowing into Trinity Bay a few miles north of Cairns;

Lucinda Point is some way to the south;

Bundaberg is near the coast opposite Great Sandy Island;

Brisbane and *Sydney* ,the capitals of Queensland and New South Wales respectively;

Parramatta, a western suburb of the latter, and *Mittagong*, an elevated town a little to the south;

Cape North is the most northern point of Queensland;

Palmerston is a coast district around Keppel Bay (or it may be the northwest district of Northern South Australia.)

Peak Down is an inland district between Drummond Range and Peak Range.

Rockhampton is near the coast at Keppel Bay.

Sandy Cape is the northern point of Great Sandy Island.

Gayndah is inland some distance about the same longitude as the south of Great Sandy Island.

(vi-xii)=June to December, 1904.

(i-iii)=January to March, 1905.

Family 1 Tetigoniidae.

Subfamily 1. Tetigoniinae.

Tribe 1 *Tetigoniini.*

This is equivalent to the Tetiigoniinae of most authors, some 40 genera are now recognized, but the limits of some of these are not sharply defined.

Elongate, head produced in front of the eyes (apically rounded or triangular, sometimes irregularly linear). Frons usually more or less convex, often much inflated; rarely flattened or even a trifle concave. Genae long and narrow between the eyes and the frons, broadening a little posteriorly. Clypeus broad, generally at least ⅔ of width of frons. Lorae small, laterally covered largely by clypeus. Rostrum short. Ocelli distinct, situated on the crown between the eyes below their anterior margin. Venation simple, often indistinct. In the type of the tribe, (the palaearctic *Tetigonia viridis* (Linn)) the two claval veins run separately into the commissure (aberrations occur); there are discoidal, 3 subapical, and 5 apical cell. A transverse vein stands on the cubital, varying in position a little even in the same individual, being sometimes basal of the median fork, sometimes apical. In many species of the typical genus this transverse vein is absent. Appendix present. In the wing there is no supernumerary cell. The other Tetigoniini do not differ greatly from this type, though sometimes the venation is more or less reticulate. Three Australian species have been described and I now add 6 more, all belonging to the typical genus:

Tetigonia Geoffroy.

Tetigonia Geoffroy, 1762, Hist. abregee Ins., I, 429. Kirkaldy, 1900, Entomologist, XXXIII, 262.
Tettigonia Latreille; Ball, 1903, Iowa Ac. Sci., 15-28, Pl. III-V, (nec Linn).
Cicadella Gray, 1832, Griffith's Anim. Kingdom, XV, 226.
Tettigoniella Jacobi, 1904, Zool. Jahrb. Syst., XIX, 778.

Antennal ledge small, scarcely visible dorsally. Head and pronotum horizontal, vertex produced before the eyes, usually obtusely rounded; frons swollen; Pronotum not twice as long as scutellum, posterior margin slightly emarginate. Tegmina broad, covering the tergites, not reticulate; with (usually) 5 discoidal (3 subapical) and 6 apical cells.

The headquarters of this cosmopolitan genus are in Central and South America.

The Australian species of *Tetigonia* are readily separable by color and size:

1. Length more than 15 mill..........7 *coerulescens* (Fabr.)
1a. Length under 15 mill..............................2
2. Ground color pale..............................3
2a. Ground color dark..............................7
3. Ground color distinctly yellowish....................4
3a. Ground color pale greenish-grey, or greyish-white, or pale cinereous. 6
4. Tegmina immaculate. 5
4a. Claval commissure blackish-brown....4 *parthaon* sp. nov.
5. Vertex 4 times as broad as long. (sec. Walker)...... ....8 *quadrata* (Walker)
5a. Vertex not more than one-half wider than long....... .. ..3 *pasiphae* sp. nov.
6. A central dark longitudinal stripe down the head, pronotum, scutellum and commissure..2 *perkinsi* sp. nov.
6a. Above mentioned stripe absent.......1 *albida* (Walker).
7. Black with orange red markings......6 *anemolua* sp. nov.
7a. Dark metallic bluish-green with ochraceous markings. ....5 *pettimolua* sp. nov.

N. B. 9 *albomarginata* (Sign.) not included.

1. *albida* (Walker.)

Tettigonia albida, Walker, 1851, List. Hom., 767, (nec. Walker, 777); Signoret, 1853, Ann. Soc. Ent., France, (3) I, 663, Pl. 21 f. 3; Melichar, 1903, Hom. Ceylon, 157 (*).

This species varies a little in size and pattern. One example in my collection, from Ceylon, has a typical right clavus, but in the left, the axillary vein joins the middle of the anal vein.

Hab: Queensland, Cairns (vii-viii), Nelson (vii) and Bundaberg (ix-xii) on sugar cane and various grasses; also occurs in Ceylon (my collection), Bombay (Melichar), Celebes (Breddin), Philippines (Stal), West and South Africa (Stal), and Madagascar (my collection).

koebelei, sp. nov.

Slender; pale testaceous; margin connecting vertex and frons

* This is not, as Melichar states (l. c.—) *pallida* Walker 776, which on the contrary= *albida* Walker 777=*nigrifascia* Walker, an American speces. The Sicilian var. *pallida* Walker (781) of *Aglena ornata* requires a new name, for which I propose *ornatula*.

ornamented with 3 ocellated spots (black, narrowly encircled with yellow). Vertex with a black median somewhat rounded stripe extending along pronotum, scutellum and claval commissure. Frons with a longitudinal submedian dark brown line on each side with downwardly curved subparallel transverse lines proceeding to the lateral margins, nearly reaching the genae. Clypeus with a longitudinal pale brownish line; lorae almost entirely pale brownish and there is a stripe of same color on genae. Ocelli redbrown. Mesonotum ornamented sublaterally with a black stripe (on each side) which shows faintly through the overlying pronotum. Underside stramineous. Posterior femora and tibiae longitudinally lined with blackish. Tegminal veins brown, basal half of cubital blackish, rather smudged.

Shape of vertex not very dissimilar to that of *T. albida* but the eyes are larger and wider in proportion and the ocelli are smaller. Head and eyes distinctly wider than pronotum which is longer than the vertex. Clypeus somewhat angulate in profile. Frons moderately swollen. Pronotum finely striate transversely, anteriorly with an obtuse angular impressed line subparallel with the arched anterior margin. Tegmina with 5 discoidals (3 subapical) and 5 apical cells.

Length 6½ mill.

Hab: Queensland, Cairns (viii) only one female, unfortunately, of this distinct species.

3. *pasiphae* sp. nov.

Pale luteous; eyes, ocelli and 2 small spots near anterior margin of scutellum, blackish. Tegmina creamy yellow with darker veins; wings milky with pale yellowish veins. Ocelli pale greenishbrown. Leg hairs pale.

Vertex as long as or a trifle longer than the pronotum, rounded apically; frons swollen, flattened medianly. Clypeus subangulate. Pronotum punctured. Tegmina with 5 discoidal (3 subapical) and 5 apical cells.

Male unknown.

Female: last abdominal sternite slightly roundly emarginate, medianly truncate; pygofers about 4½ times as long as the last, narrowing posteriorly, sides not rounded posteriorly; in profile, apex narrowly rounded.

Female. Length 12¾ mill.

Hab: Queensland, Cairns (viii), arboreal.

In one specimen, the sternites are orange-yellow.

4. *parthaon*, sp. nov. (Pl. XXIII, fig. 1-3).

Same size and form as *T. pasiphae* but differently patterned, and frons a little more swollen.

Head, pronotum, scutellum, tegmina and underside pale yellowish, more or less tinged with orange. Eyes, 2 spots at base of pronotum, 2 at anterior margin of scutellum, claval commissure, etc., blackish. Ocelli pale greenish brown. Wings milky, veins more or less orange-yellow. Leg hairs pale. Abdomen orange. Membrane internally smoky.

Male: Last abdominal sternite truncate, plates a little more than twice as long as above; basal half broad, roundly narrowing, then more rapidly so towards the middle line of the abdomen, apices acute, fringed with soft hairs; pygofers much longer than plates.

Female: Pygofers longer and narrower than in *T. pasiphae*, about 3 times as long as last sternite, which is roundly emarginate; pygofers widen out a little before middle, then narrow rapidly; posteriorly narrowly truncate in profile

Length 10-10½ mill.

Hab: Queensland, Cairns (viii), Kuranda (viii), on *Saccharum officinale* and grasses.

The nymph of this form is figured on Pl. XXIII, fig. 3.

5. *pettimolua*, sp. nov.

Pale ochraceous, with the following markings blackish tinged more or less with metallic greenish or bluish—on the anterior margin of the head—3 rather blotchy spots, and 2 at the base; the lateral margins of the pronotum and 2 spots at the apical margin; at the base a blotch which is somewhat of the conventional figure of a bat with out-stretched wings, the "head" touching the intero-posterior angles of the anterior spots. Scutellum with 3 anterior spots. Frons with 2 submedian longitudinal stripes, sometimes meeting posteriorly; these are shortly pectinate, representing the usual striations on the *Tetigonia*-frons, but the lateral parts of the striations are pale ochraceous, concolorous with the ground color of the face. Tegmina dark metallic green, costal cell opaque whitish (or pale yellowish) narrowly bordered with black. Abdominal tergites mostly bluish-black. Anterior and intermediate tibiae and tarsi dark.

Male: Penultimate sternite roundly emarginate, ultimate truncate, plates formed much as in *T. parthaon* but about 3 times

as long as last sternite, more elongate apically and there curving upwards (towards the dorsum), plentifully fringed with soft long white hairs.

Female: Last sternite roundly emarginate, laterally angulate, pygofers about $2\frac{3}{4}$ times as wide as the above, medianly swollen, apically roundly subtruncate in profile; furnished with short black hairs.

Length $6\frac{1}{2}$-7 mill.

Hab: New South Wales, Sydney (i-ii).

N. B. The dark colouring sometimes encroaches in a smudged manner more or less on the pale.

6. *anemolua*, sp. nov.

Basal half of vertex, pronotum, scutellum, tegmina etc., black, the latter more or less translucent apicoexteriorly. Apical half of vertex posterior margin very narrowly, a broad, slightly, arched transverse band across middle of pronotum (sometimes narower and interrupted in the middle, the clavus (except the interior area)—reddish castaneous or dark orange red. Underside pallid except the mesoternum. Abdominal tergites black.

Male: Sternites more or less (generally more) black. Pygofers rather short, rounded, acute apically, about $2\frac{1}{2}$ to 3 times as long as last sternite which is somewhat roundly emarginate.

Female: Sternites pallid except part of the ovipositor. Pygofers about 5 times as long as last sternite, an oblique keel on each side starting from exterobasal angle and meeting in the middle at a little more than one-third of the length; not rounded laterally, furnished with white hairs. Last segment truncate, slightly notched medianly.

Length $4\frac{1}{4}$-5 mill.

Hab: Queensland, Kuranda (viii), arboreal.

7. *coerulescens* (Fabricius.)

Cicada coerulescens Fabricius 1803 Syst. Rhyng. 74.
Aulacizes dives Walker 1851 List. Hom. 791.
Tettigonia caerulescens Signoret 672 Pl. 21, fig. 16.
Hab: Australia.

8. *quadrata* (Walker.)

Tettigonia quadrata Walker 1851 List. Hom. 781.
Hab: Tasmania.

9. *albomarginata* (Signoret.)

Tettigonia albomarginata Signoret 1853 Ann. Soc. Ent. France.

(3) I, Pl. 10 fig. 4.

These three species are unknown to me, and I regret also that Signoret's descriptions remain unknown to me, as his 'Essai' was unpurchasable. The same author describes *Tettigonia varicolor*, 1852 op. c. II, 15, Pl. 1, fig. 15 from Honolulu, most probably in error, as no *Tetigonia* is now known here and a not inconsiderable part of Signoret's collection is notoriously labelled incorrectly.

Tribe 2 *Macroceratogoniini.*

Instituted for a single, new, genus *Macroceratogonia* which has the general facies of the first tribe and also of the third, but a very different head structure. The vertex is subhorizontal, flat, subquadrangularly produced before the eyes, wider apically than at the base; ocelli on the vertex anterior to the apical margin of the eyes. Antennal seta enormously long.

Macroceratogonia, gen. nov.

Pronotum, clavus, etc., finely punctured. Head slightly declivous; vertex at base less than ½ the width of pronotum apically; lateral margins keeled, diverging somewhat sinuately, the vertex being thus wider at apex than at base and nearly as long as wide; apical margin slightly rounded; basal ¾ narrowly sulcate, anterior fourth transversely somewhat sinuately impressed; immediately below the impression and a little nearer to the middle line than to the lateral margins are the conspicuous ocelli. The crown is separated from the frons by a narrow, well marked, continuous channel. The antennae are situated almost at the antero-lateral angles, first segment small, rounded bulbous, second small cylindric, seta enormously long, much longer than the entire body. Frons narrow, and curves from the insertion of the antennae; clypeus elongate, parallelsided: lorae curved exteriorly, not reaching the apical margin of the face, extending basally beyond the clypeus. Pronotum rounded anteriorly, lateral margins posteriorly divergent, postero-lateral angles rounded, posterior margin subtruncate. Tegmina with 2 discoidal and 2 subapical cells, the exterior discoidal be-

ing undivided up to the apical cells. Appendix present. Wings with supernumerary cell. Legs typically Tetigonian.

14. *aurea*, sp. nov. (Pl. XXII, figs. 6-7.)

Pale golden yellow, tegminal appendix and underside paler. Eyes dark, and a small dark spot at base of appendix.

Length 9 mill.

Hab: Queensland, Kuranda (viii), arboreal.

Two females only. I would have included this remarkable genus in the Tetigoniini but it would have made too many exceptions in otherwise fairly sharply defined group-characters.

Subfam. 2. Iassinae.

Tribe 1. *Iassini.*

Vertex subquadrate, its sides and posterior margin elevated; frons elongate, narrow; clypeus wider posteriorly than at its base; ocelli on the curve of the head; usually only one subapical cell (but in *Tharra* Kirkaldy, the exterior discoidal is divided by a transverse vein thus forming another subapical); wings with a supernumerary cell. There are apparently 6 genera in this tribe viz: *Iassus* Fabricius (=*Coelidia* Germar and *Daridna* Walker). *Terulia* Stal, *Petalopoda* Spangberg, *Tinobregmus* Van Duzee, *Tharra* Kirkaldy and *Palicus* Stal; the latter, which is an African genus, I do not know; *Tharra* is Australian, the rest American.

Tharra, gen. nov.

Differs from *Iassus* Fabr. by the possession of 2 subapical cells and the absence of transverse veins in the clavus. From *Terulia* it differs by the subapical cells and by the straight anterior tibiae.

Vertex flat, longer than wide, slightly declivious with regard to the pronotum, abruptly elevated at the lateral margins, the sides being at right angles to the disk,* which is very narrowly sulcate longitudinally up to the apical margin of the eyes and is produced a little, widened just apical to the eyes and rounded obtusely.

Eyes large, a little oblique; ocelli a little nearer to the lateral margins than the middle of the vertex, Frons elongate, nar-

* This is probably a tribal character, as stated above, but as Spangberg's figures do not show this clearly, I have mentioned it again in the generic characters.

row and gradually narrowing posteriorly. Clypeus quadrangular, a little longer than wide, distinctly wider at apex than at base; lorae small, not reaching to the apex of the face; genae narrow. Antennal seta long. Rostrum reaching to intermediate coxae, distinctly wider at the apex than at the base. Pronotum transverse, much wider than head and eyes, arched anteriorly, lateral margins rather short, posterior margin straight. Scutellum about as long as the pronotum. Clavus without transverse veins. Corium with 2 discoidal, 2 subapical and 5 apical cells. Anterior femora, anterior tibiae and intermediate femora subequal in length, slender, straight; intermediate tibiae about $\frac{1}{5}$ longer than anterior tibiae and about as long as posterior femora; posterior tibiae twice as long as intermediate tibiae; posterior femora reaching as far as, or beyond the apex of abdomen.

1. *labena*, sp. nov.

Vertex sordid testaceous; frons blackish, rest of face, sterna, basal half of abdomen beneath, legs (except as undermentioned) etc., more or less pale luteous. Eyes, apical half of abdomen beneath, genital valve (female), apical half of posterior tibiae, posterior tarsi and all the claws, blackish. Pronotum and anterior half of scutellum sordid purplishbrown, posterior half of scutellum sordid yellowish. Tegmina yellowish translucent, veins crimson; an irregular spot at extreme base of corium, a spot near apex of costal cell, and about the apical half of each of the apical cells, etc., blackish. Wings dark smoky.

Female: Valve covered thickly with long, curling, rather coarse, white hairs.

Length $5\frac{1}{3}$ mill., width at base of pronotum $1\frac{1}{4}$ mill.

Hab: Queensland, Kuranda (viii), arboreal.

Unfortunately only one female of this interesting form. It has a distinctly Fulgorid look about it, and Mr. Perkins informs me that it also appears so in life.

Tribe 2. *Cephalelini*.

Phrynomorphus Curtis.

Phrynomorphus Curtis, 1833, Ent. Mag. I, 194.

Athysanus Burmeister, 1838, Gen. Ins. Jassus; Edwards, 1896, Hem. Hom. Brit. 136 Pl. II, fig. 10, etc.

This genus is extremely closely allied to *Deltocephalus,* the only difference I can find being that the vertex in the latter is usually more angulate and there are 5 discoidal cells instead of 4 as in *Phrynomorphus,* and in the latter there is usually only one transverse vein standing on the cubital.

The species are all obscure and of very ordinary appearance. I have indicated their uninteresting nature by the specific names bestowed on them.

1. *longuinquus* sp. nov.

Vertex broad, about as long as wide between the eyes, apically rounded (a little angularly, this being accentuated by the pattern), disk depressed in the middle. Frons broad, laterally rounded, apical margin slightly emarginate, about $3\frac{1}{4}$ times as wide between the eyes as at apex. Temples linear. Ocelli on a level with the disk of the vertex before the upper margin of the eyes. Clypeus wider than lorae, genae exterolaterally posteriorly strongly angulate. Pronotum short, more than twice as broad as long, lateral margins obsolescent, posterior margin truncate, posterolateral angles obsolete. Tegmina short, without appendix, not or scarcely reaching to apex of abdomen, 3 discoidals (2 subapical) and 5 minute apical cells. Pale cinereo-testaceous, frons with close transverse dark lines radiating from each side of the central pallid line, continued a little over to the vertex, these latter being subconcentrically angulate(these lines are often more or less obsolescent.) Tegminal nervures a little paler than the ground colour, apically somewhat obscurely broken up by darker colour. Abdominal tergites more or less dark. Mesopleura with some more or less cloudy spots. Hairs on legs etc., black.

Male: 6th sternite obtusangularly emarginate, 7th slightly convex apically. Valves a little more than twice as long as 7th medianly, nearly as wide as long, lateral margins somewhat sinuate, posterior angle irregularly rounded.

Female: Pygofers brownish in the middle spotted with pallid. Little distinctive about them.

Length: $3\frac{3}{4}$ mill; width across eyes $1\frac{1}{3}$-$1\frac{1}{2}$ mill.

Hab: New South Wales, Sydney (i-ii), Mittagong (i).

2. *taedius,* sp. nov.

Of similar size and general appearance to the preceding but differs as follows:

Vertex shorter than wide, slightly angulately rounded apically. Frons a little flatter, temples wider. Clypeus scarcely wider than lorae, genae less angulate. Pronotum with short but noticeable lateral margins. Coloring very similar but vertex, pronotum and scutellum with only obscure scattered pale-brown mottlings. Underside darker, anterior femora striped transversely with black. This seems to approach *Phlepsius* in some ways.

Length: 3¾ mill.

Hab: Queensland, Bundaberg (xi).

3. *fatigandus*, sp. nov.

Very similar specifically to *Phrynophyes indignus* but smaller and the frons immaculate, legs pallid. Vertex between the eyes about two-thirds of length of exterolateral margin of an eye.

Male: Propleura with black disk; lateral margins of sternites narrowly blackish; tergites pale organge-brown. Tegmina reaching beyond apex of abdomen.

Female: 7th sternite slightly emarginate, pygofers 4-5 times as long as seventh sternite, ovipositor one-third longer than pygofers, extending beyond apex of tegmina.

Length, male 4⅞; female 5¼ mill.

Hab: Queensland, Cairns, Kuranda (viii) on grass.

Phrynophyes gen. nov.

Probably an offshoot from *Phrynomorphus*; it has much of the facies of *Lonatura*.

Head produced triangularly in front, longer than the width between the eyes, also a little wider between the eyes than the width of an eye. Eyes large, included in the curve of the head. Lateralmargins of pronotum short (but noticeable), not carinate. Tegmina abbreviated, venation somewhat obscure, 2 veins standing on cubital close together, rest of venation typically Phrynomorphoid, except that the clavus is reticulate. Type *P. phrynophyes*.

1. *phrynophyes*, sp. nov.

(Pl. XXIV, figs. 7-8.)

Pale cinereotestaceous (? metallic greenish grey when alive), frons pale brownish with somewhat feeble radiating lines from

a wide, middle, immaculate area. Underside pale marked with brownish black. Veins of tegmina mostly whitish. Tergites laterally marked with black. Ocelli either absent, or present on one side. Frons convex basally, flattening gradually towards the truncate apex. Clypeus sub-parallelsided, broader than the lorae. Genae scarcely angular posteriorly. Pronotum shorter than the vertex. Tegmina with 3 or 4 discoidal, and 5 apical cells.

Female: 7th sternite very obtusangulately emarginate; pygofers long and narrow, 5 to 6 times as long as 7th sternite; ovipositor about one third longer than pygofers. Tegmina not nearly reaching apex of abdomen.

Length nearly 6 mill.

Hab: Queensland, Bundaberg, on grass (ix-xii); a specimen from Brisbane (xi) may be distinct.

2. *parvula*, sp. nov.

(Pl. XXII, figs. 1-3.)

When alive, metallic green, but fades after death to a shiny testaceous; tegmina and tergites more or less greyish metallic. Face pale sordid brownish, legs more or less marked with brown.

Female: elongate, tapering anteriorly and posteriorly. Vertex about 3 times as long as wide between the eyes, anteriorly acuminate, somewhat ascendant. Frons 5-hedral, long-diamond shaped, with a fifth side anteriorly, about as wide as clypeus, which is a trifle wider than the lorae; the latter do not quite reach the posterior margin of the genae. Tegmina very short, truncate. Ultimate segment roundly produced, pygofers elongate, narrow, largely exposing the very long ovipositor.

Length 6¼ mill; width about 1 mill.

Hab: Queensland, Bundaberg (ix-xii), on grasses.

There is also a single male from Bundaberg (xi) which probably belongs to this. Head acute anteriorly, more or less porrect, about one-half, or a little more, longer than wide between the eyes.

Length 4 mill.

Female nymphs are very similar to the adults.

I think it is this species that has been described by Buckton as a Membracid (!!) under the name of *Philya parvula* (1901 Mon. Membr. p. 57, Pl. 8, fig. 4.)

Anemolua gen. nov.

Vertex slightly convex and a little declivous; about one-half longer than wide between the eyes. Eyes large, each much wider than the vertex at the base, interolateral margin divergent towards the apex; vertex rounded in front of eyes, the latter forming part of the curve of the head. Vertex impressed at the base, sulculate mediolongitudinally. Frons elongate, about two thirds longer than wide at base, lateral margins somewhat straight, gradually narrowing towards the apical margin, which is scarcely wider than base of clypeus. Antennae elongate. Clypeus much longer than wide, widening slightly apically, lorae small, scarcely reaching further posteriorly than half the length of the clypeus; genae not angulate exterolaterally posteriorly. Pronotum slightly arched anteriorly, roundly emarginate posteriorly, lightly carinate longitudinally, lateral margins obsolescent. Scutellum shorter than wide. Tegmina reticulate, fundamentally 4 or 5 discoidals. Posterior legs elongate.

I placed this at first near *Iassus* and *Terulia* but the venation is very different, and the vertex is, if anything, *below* the dorsal level of the eyes.

1. *hanuala* sp. nov.

Testaceous; vertex with a black impressed spot near the base on each side of the sulculation.

Frons and clypeus pale brownish. Pleura and legs more or less blackish. Pronotum and scutellum marked with whitish. Tegmina brownish, veins and some blotches on costa etc. whitish; sometimes a blackish blotch near middle of tegmina.

Length $3\frac{3}{4}$-$5\frac{1}{8}$ mill.

Female: abdomen longer than tegmina; last segment roundly emarginate, pygofers about four times as long as the latter, ovipositor very long.

Hab: Queensland, Cairns (viii), arboreal.

Anemochrea gen. nov.

Closely allied to *Anemolua* but differs as follows:

Vertex almost as long in front of apical margin of eyes as behind, acuteangled apically; frons elongate suboval; Clypeus parallelsided. Lateral margins of pronotum short, but noticeable, not carinate, posterior margin truncate. Apical cells of

tegmina strongly marked off, not reticulate. Venation of wings (which are very short) obscure.

1. *mitis* sp. nov.

(Pl. XXII, figs. 8-9.)

Dark brownish testaceous. Vertex blackish brown with two narrow transverse pallid lines, one midway between apex and apical margin of eyes and the other a little posterior to the apical margin of eyes. Face greyish, frons laterally with 8 or 9 somewhat remotely placed brownish transverse lines. Pleura and most of sternites (except genitalia) blackish. Tegmina with whitish veins, apical cells brownish-black posteriorly. Legs more or less pale brownish. Basal half of abdomen above, and a median line on rest of tergites, black.

Length 3-4½ mill.

Hab: New South Wales, Sydney (i-ii), Mittagong (i), Paramatta (i).

Var: Vertex somewhat pale; with apex, a bar between or above eyes, and a broken bar near base, blackish-brown.

The nymphs are not remarkable.

Deltocephalus Burmeister.

Deltocephalus Burm. 1838 Gen. Ins. Jassus subg. 3.

1. (?) *perparvus*, sp. nov.

Pale yellowish testaceous. Eyes blackish grey. A minute black spot at side of last tergite, and two almost contiguous black-brown spots on the preceding tergite. Sternites and pleurites spotted with blackish brown. Vertex distinctly longer medianly than at eyes, triangularly rounded in front, margin in front of eyes straight; vertex somewhat flat, a large rounded depression on each side of the middle line. Clypeus as wide anteriorly as frons posteriorly, which very gradually widens at clypeus, extending anteriorly beyond base of clypeus, posteriorly nearly touching margin of genae. Pronotum short, scarcely twice as broad as long, anteriorly arched, posteriorly slightly emarginate, sides very short. Tegmina short, reaching only to half the length of the abdomen, without appendix; venation very

obscure, but I think there are five discoidals. Clavus nearly as large as the apically rounded corium. Wings minute.

Length $2\frac{1}{3}$ mill.

Hab: New South Wales, Mittagong (i), Sydney (ii).

Eutettix Van Duzee.

Eutettix Van Duzee, 1892 Psyche, VI, 307; T. Amer. E. S., XIX, 300.

1. *sellata* (Uhler.)

Thamnotettix sellata Uhler, 1896, P. U. S. N. Mus., XIX, 294. *Eutettix sellatus* Matsumura, 1902, Termesz. fuzetek, XXV, 381. fig. 12; Melichar, 1903, Hom. Ceylon, 189.

Hab: Queensland, Kuranda (viii), Cairns (viii), Nelson (vii), Bundaberg, (ix-xii) on Sandhills, arboreal, (Koebele's No. 2299), also from Japan (Uhler), Ceylon (Kirkaldy), Papua, Java and Africa (Melichar), etc.

2 sp. nov.

Hab: Queensland, Cairns, Nelson, Bundaberg, on *Melaleuca*.

Nephotettix Matsumura.

Nephotettix Mats., 1902, Termesz, fuzetek, XXV, 356 and 378; Melichar, 1903, Hom. Ceylon 1902.

Melichar has confused *Selenocephalus cincticeps* Uhler from Japan (destructive to *Oryza sativa*) with a Sinhalese species which he identifies with *Pediopsis apicalis* and *P. nigromaculatus* Motshulsky. *N. apicatis* however differs from *cincticeps* as will be shown later, while a Madagascan species is closely allied also. I think that (*Cicada*) *bipunctata* Fabr. (=*Thamnotettix bipunctata* Stal) should replace the name *apicalis*, while (T) *nigropicta* Stal should replace *cincticeps Uhler*.

1. *plebeius* sp. nov.

Pale testaceous; a blackish transverse stripe on the vertex extending from eye to eye, immediately below the ocelli, not curving parallel with anterior margin but nearly straight across Frons pale testaceous from the base of the clypeus long-triangularly to base of frons; on each side of this to lateral margins

of frons about 8 parallel, transverse blackish lines on each side (sutures of clypeus, etc., sometimes infuscate.) Pronotum subanteriorly with a somewhat feeble, arched, repeatedly broken blackish transverse line extending from side to side. Scutellum with usually 2 pale brownish specks about the middle. Tegmina hyaline pale cinereous, nervures brownish. Bristles on legs blackish brown.

Vertex twice as wide as long, rounded apically; frons broad, not widening from basal margin to antennal articulation, about two and a quarter times as wide as the base of the clypeus; clypeus a little broader than lorae; temples very narrow. Pronotum longer than the head, posterior margin truncate. First apical cell basally in a line with the base of the exterior subapical cell and much longer than it; second apical cell 5-hedral, sides more or less straight (except the apical margin).

Male valve about three-fourths of the length of the 7th. abdominal sternite (which is apically truncate) and about one-third of the length of the plates which are furnished with bristly hairs. Pygofers about the same length as, or a little longer than the plates, furnished with bristly hairs.

Female: 7th. sternite about twice as long as the 6th, longitudinally sulcate and apically notched in the middle to admit base of sawcase; pygofers about 4 times as long as 7th. sternite, furnished with granules which emit short bristly hairs; ovipositor longer than the pygofers.

Length (male) $4\frac{7}{8}$-$5\frac{1}{8}$ mill; (female) $5\frac{1}{3}$-$5\frac{7}{8}$ mill.

Hab: Queensland, Cairns (vii-viii), Bundaberg (ix-xii), Redlynch (vii), Lucinda Point (vii), on grasses; Koebele 2296 on sand-hills (ix), New South Wales, Sydney (i), Parramatta (i), probably introduced.

2. *contemptus* sp. nov.

Testaceous, the vertex with a curved blackish brown line anteriorly, parallel with the anterior margin; frons with a brownish black line close to basal margin and parallel with it; clypeus more or less brownish. Pronotum more or less clouded with greyish. Tegmina pale yellowish hyaline; apical veins brownish; wings smoky. Abdominal tergites more or less blackish on the disk, laterally more or less pallid.

Vertex a little more produced perhaps than in *plebeius*, frons narrowing suddenly soon after its basal margin as far as antennae, then narrowing gradually to clypeus, which is sublinear,

much narrower than the lorae. First apical cell short, shorter than the 1st. subapical; second apical cell semi-circular.

Male unknown.

Female: 7th. sternite scutiform, carinate longitudinally, angularly rounded behind, the posterior angle very slightly produced again. Pygofers yellowish rufescent (with golden yellow hairs), shorter than the rufescent ovipositor.

Length: (female), 5¼ mill.

Hab: New South Wales, Sydney (i-ii).

A much slenderer species than *N. plebeius*, with different venation and different markings on the head.

3. *N. nigropicta* (Stal.)

Thamnotettix nigropicta Stal, 1871, O. V. A. F. 740.

Hab: Queensland, Cairns, on grasses. (Also from Philippines, China and Japan).

This species is closely allied to *N. bipunctata* (Fabr.)

Scaphoideus Uhler.

Scaphoideus Uhler, 1891 Trans., Maryland Ac. Sci. I, 33; Osborn, 1900, J. Cincinnati Soc., N. H., XIX 187.

Distributed through America, Japan and Oriental Region and I now describe a species from Australia.

1. *pristidens*, sp. nov.

Testaceous, more or less tinged with pink or yellow; vertex with two black spots at anterior margin and two irregular ochraceous brown spots just posterior. Frons anteriorly with about five transverse black lines (sometimes more or less interrupted). Pronotum more or less blotched laterally. Scutellum with two basal pinkish brown spots. There is a white median line from apical margin of vertex to posterior angle of scutellum. Tegminal picturation not cruciate, testaceous, veins brown, cells more or less fuscate; clavus with 3 large white spots contiguous to the commissure. Posterior legs and anterior and intermediate tibiae and tarsi spotted or ringed with black. Abdominal sternites more or less striped transversely with black. Vertex somewhat flat with a transverse impressed line; edges subacute; longer than wide, anteriorly triangular, acuteangled, lorae contiguous with posterior margin of genae.

Venation of corium very similar to that of *S. ochraceous* Osborn; outer claval vein hooked, and vein with a cross vein about its middle length.

Length: $4\frac{1}{2}$-$5\frac{1}{2}$ mill.

Hab: Queensland, Cairns (viii).

N. B. The coloring and pattern is sometimes obscure.

The genus *Aphrodes* and its allies appear to be descended from some form very near *Phrynomorphus*, the ocelli being placed a little more dorsally and the tegmina being semicoriaceous and often much abbreviated, appendix always wanting; the wings have an incomplete submarginal vein. These characters which are simply due to the degradation of the flight organs and which may, and do, arise in any group of winged insects, have been used to form a family, viz.: Acocephalidae, though they are really scarcely sufficient to form a tribe.

Four genera showing these characters are known, viz.:

1. *Aphrodes* Curtis (=*Acucephalus* Germar=*Acocephalus* Burmeister=*Pholetaera* Zetterstedt=*Anoscopus* Kirschb).
2. *Stroggylocephalus* Flor (=*Strongylocephalus* Fieb).
3. *Kosmiopelex* Kirkaldy and
4. *Xestocephalus* Van Duzee, this last probably not really belonging here.

Kosmiopelex gen. nov.

Differs from *Aphrodes* by the differently shaped, foliaceous head, from *Eupelix* Germar by the eyes not being enclosed by the sides of the crown.

Head triangular, more or less porrect, specifically variable in this respect; foliaceous. Crown flattish, longer than wide between the eyes, from three to four times as long as pronotum, lateral margins in front of eyes slightly sinuate, apical fourth subspatulate. Frons oblongoval, twice as long as wide; genae at antennal sockets about three-fourths of the width of the clypeus which is parallel-sided, a little wider than lorae, the latter not quite touching posterior margin of genae. Eyes large, forming part of the curve of the head, not enclosed by lateral margin of crown. Ocelli on the disk of the crown just above anterior margin of the eyes, a little nearer lateral margins than the middle line. Pronotum transverse, about three times as wide as long, slightly arched anteriorly, very obtuseangularly emarginate posteriorly; lateral margins short. Tegmina coriaceous, abbreviated, reaching little beyond base of abdomen,

posteriorly truncate, venation obscure; wings minute, venation obscure, submarginal vein absent. Legs normal.

1. *varicolor* sp. nov. (Pl. XXIII figs. 7-8.)

Typically: head, pronotum and scutellum pallid testaceous, marked with brownish black. Tegmina shining blackish brown, posterior margin widely milky white. Abdominal tergites shining blackish brown, except the white genital segment. Legs black and white, more or less mottled.

The species varies considerably in color and pattern, however, like its congeners, independent of sex. The general color may be pale testaceous, abdominal tergites pale yellowish brown, no clear markings, or in the other direction, like the type, but pronotum milk white and a milk white band across.

Length: $2\frac{7}{8}$-$3\frac{1}{2}$ mill.

Hab: Queensland, Bundaberg (ix-xii).

There is nothing notable about the nymph.

Dryadomorpha, gen. nov.

Superfically somewhat like *Cephalius*, but the ocelli are frontal and the face is shaped differently etc. Vertex acutely produced in front of the eyes, a little longer than wide at the base, slightly concave, basal half sulcate longitudinally; longitudinally finely striate; anterior margin of head acute. A sensory depression close to each eye near the base. Eyes large, not forming part of the curve of the head. Ocelli very small, immediately in front of the acute margin of the head, nearly midway between eye and apex of vertex. Face angularly convex, diamond shaped, frons elongate, subconstricted at the antennal articulations. Clypeus fused with frons, widening out posteriorly, posterior margin slightly notched in the middle, reaching beyond posterior margin of genae. Lorae wider than the clypeus anteriorly, not nearly touching posterior margin of genae. Posterolateral margin of face oblique, not angulate almost direct between eye and clypeus. Antennae long, reaching at least beyond last sternite. Pronotum finely striate transversely, anteriorly arched, lateral margins evanescent. Scutellum a trifle wider than long. The venation of tegmina and wings is so feeble that I have not been able to interpret it; it seems to be Phrynomorphoid.

1. *pallida*, sp. nov. (Pl. XXXII figs. 12-14.)

Pale golden yellow. Eyes brownish red.
Male: unknown.
Female: last sternite short, posterior margins slightly notched; pygofers marked with a groove on each side.
Length, 7 mill.
Hab: Queensland, Bundaberg, (ix-xii).
Only one female unfortunately of this interesting form.

Giffardia, gen. nov.

Superficially allied to *Dorycephalus* etc., but is probably an offshoot from some form near *Phrynomorphus*.

Head elongate, tapering; vertex longer than wide across the eyes, about 5 (male) 6 (female) (This is not absolutely constant) times as long as wide between eyes at base, prolongation elongate-triangular, flat, porrect or slightly declivous towards the apex, longitudinally carinate. Frons elongate, a little more than four times as long as wide between antennae. Clypeus a trifle wider at apex than at base, a little wider than the lorae which do not nearly touch its posterior margin. Eyes large. elongate, suboblique, not included in the curve of the head. ocelli small, on the anterior margin of the head, a little remote from the eyes. Antennae elongate, socketted at about one-third of the length of the eyes. Pronotum arched anteriorly pronotum and scutellum longitudinally carinate. Tegminal venation simple, 4 discoidals and 5 apical; wing venation normal. Posterior femora swollen a little at apex, with two hooks.

1. *dolichocephala*, sp. nov. (Pl. XXII, figs. 4 and 5.)

More or less pale yellowish testaceous, a longitudinal brownish line from apex of vertex to posterior margin of scutellum, the keel on these parts being often pale and the brown line more or less interrupted, sometimes irregularly widened, on the vertex. On each of the genae is a thin brown smudged line, uniting anteriorly on the frons. Tegminal veins whitish, whole internal margin smoky, as also two small spots, one on each side of the 2nd apical vein. Leg hairs pale.
Male: Tegmina extending beyond apex of abdomen.
Female: Tegmina not extending to apex of abdomen.
Length: (male) $5\frac{1}{2}$-$6\frac{1}{2}$, (female $8\frac{1}{4}$ mill.

Hab: Queensland, Cairns (vii-viii) Kuranda, (viii) on grasses. The nymphs do not apparently differ from the adult in any important non-instaral characters.

Reuteriella Signoret.

Reuteria Signoret 1879, A. S. E. France (5) IX, 51 and 1880 op. c., X 45. (preocc.)
Reuteriella Signoret 1880 op. c., 365.

1. *flavescens* (Signoret.)

Reuteria flavescens Signoret 1880, op. c., 46 pl. 1, fig. 40.
Hab: Tasmania.

Thomsonia Signoret.

Thomsonia Signoret 1879 op. c., IX 51.
Thomsoniella Signoret 1880 op. c., X 52.

1. *arcuatus* (Motshulsky.)

Acocephalus arcuatus Motshulsky, 1859 Etudes Entom. VIII, 115; and 1863 Bull. Soc. Imp. Moscou XXXVI, 2 p. 100 (Sec. Melichar.)
Tetigonia kalidasa Kirkaldy, 1900 Entom. XXXIII, 294.
Thomsoniella arcuta Melichar, 1903 Hom. Ceylon 172.
This seems to me rather a *Parabolocratus* than a *Thomsonia*.
Hab: Queensland; Cairns (vii-viii), Kuranda (vii) Ceylon (my collection.)

2. *lineolatus* (Motsh.)

Platymetopius lineolatus Motshulsky 1859 Etudes Entom. VIII, 114 (Sec. Melichar.
Deltocephalus rubrolineatus Motshulsky, 1863 Bull. Soc. Imp. Moscou XXXVI, 2, p. 98 (Sec. Melichar.)
Thomsoniella porrecta Melichar 1903 Hom. Ceylon 173.
Walker's description of *Acocephalus porrectus* does not seem to apply to this.
Hab: Queensland Cairns (viii); Ceylon (my coll.)
This too seems to belong to *Parabolocratus* rather than to *Thomsonia*.

3. *kirschbaumii* (Stal.)

Hecalus kirschbaumii Stal 1871, O. V. A. F., 737.
Thomsoniella kirchbaumii (sic!) Signorea 1880 A. S. S. F. (5) X. 52, Pl. 1, f. 44.
T. kirschbaumii Melichar, 1903 Hom. Ceylon 171.
Hab: Queensland, Cairns (vii-viii); Ceylon (my coll.); India (Signoret); Philippines (Stal.)

Hecalus Stal.

Hecalus Stal, 1864, A. S. E., France (4), IV, 65; Signoret, 1879, op. c., IX, 61 and 226.

1. *pallescens* Stal.

Hecalus pallescens Stal, 1864, op. c., (4), IV, 65; Signoret, 1879, op. c., (5), IX, 270, Pl. 7, fig. 24.

I have not seen this species, which may be a trifle larger than *H. immaculatus*; it apparently has the head only slightly foliaceous (while in *H. immaculatus*, it is somewhat widely so); there is a black spot at the apex of the clavus and 4 longitudinal brown bands on the tergites. The tegmina reach nearly to apex of abdomen.

Female: Length 10 mill.

2. *immaculatus*, sp. nov. (Pl. VII figs. 1-2.)

Very similar to the preceding, but the head is a little longer and broader, and the whole insect is pale greenish, shading off a little darker or lighter, but immaculate. All the examples collected have the tegmina not reaching as far as the apical margin of the (apparent) second tergite.

Female: sheath rosy.

Hab: Queensland, Cairns (vii-viii), Kuranda (viii) on grasses.

Cephalelus Percheron.

Cephalelus Percheron, 1832, Mag. Zool., II, Pl. 48; Burmeister, 1838, Gen. Ins., (No. 4) Pl., Signoret, 1879, A. S. E. France (5), IX, 50 and 259.
Dorydium Burmeister, 1835, Handb. Ent., II, 106; Kirby, 1894, T. E. S. London, 412.

1. *brunneus* Waterhouse. (Pl. XXIV, f. 5-6.)

Cephalelus brunneus, G. B. Waterhouse, 1839, T. E. S. London, II, 195.

Hab: New South Wales, Sydney, (i, also Waterhouse).*

2. *marginatus*, Waterhouse.

C. marginatus, Waterh., l. c.

Hab: King George's Sound.

I cannot identify this satisfactorily; I think two forms are confused. The nymphs in this genus are in all stages very similar to the adults.

Paradorydium Kirkaldy.

Dorydium Burmeister, 1838, Gen. Ins., (No. 5); and 1839, Handb. Ent., II, 1006; Signoret, 1879. A. S. E., France, (5), IX, 261. Pl. VII, figs. 21-2.

Paradorydium Kirkaldy, 1901, Entom. XXXIV 339.

1. *menalus* sp. nov.

Testaceous, or more or less rosy, or more or less tinged with ferruginous, veins paler. Head, pronotum and scutellum obscurely and smudgily flecked with blackish brown, the punctures being darkish. Sterna and sternites usually more or less tinged with pinkish. Elongate fusiform; head about as long as nota and tegmina together, gradually converging towards apex which is angularly rounded; sides acutely carinate for at least the anterior two thirds. Head, pronotum and scutellum finely and closely punctured, clavus lightly punctured. Vertex, pronotum and scutellum longitudinally carinate. Frons very strongly carinate, a little swollen near the clypeus. Pronotum with two sublateral keels on each side, a little more obsolescent than the median one, basal margin slightly angulately emarginate. Tegmina longer than abdomen.

Length: 10½ (male); 12 female) mill; width about ¾ mill.

Hab: Queensland, Cairns (viii), Nelson (vii), Kuranda (viii.)

The head as seen in profile is much longer and flatter than in any other species known to me. The males are smaller than the other sex, and the vertex inclines a little to be spatulate apically.

* Kirby says that *C. marginatus* and *brunneus* do not belong to *Cephalelus*; the description of the latter, however, at least, agrees very well with forms of *Cephalelus* before me.

2. *pseudolyricen* sp. ncv.

Smaller than the preceding and the capital process shorter and more spatulate, the female being more narrowed at the middle of the process. Testaceous, minutely and closely punctured and spotted with brown, apex of process dark brown; two black spots on anterior margin of scutellum near antero-lateral angle. Tegmina pale yellowish brown, lateral margins pallid. Sterna (except laterally) and abdomen (more or less) blackish. Capital process somewhat ascendant apically, about 2½ times as long as the width of the head basally. Tegmina longer than abdomen, with the nota about two-thirds to seven-eighths longer than the head.

Length: 5¾ (male), 8¼ (female) mill.

Hab: Queensland, Brisbane (xi), Bundaberg (ix-xii.)

3. ? *foveolatum* (Signoret).

Dorydium (?) *foveolatum* Signoret, 1880, A. S. E. France (5), X, 144. Pl. I, f. 39.

Hab: West Australia (Signoret).

Dorycephalus Kush.

Dorycephalus Kushakevitsh, 1866, Trud'i Russk. IV, 102; Signoret, 1879, A. S. E. France (5), IX, 265.

1. *ianthe* sp. nov.

Testaceous with a ferruginous tinge on the head. Abdomen mostly black above, punctured very finely and closely with golden yellow. Head nearly twice as long as wide, about four times as long as the pronotum.

Length: 6¾ mill.

Hab: Queensland; Bundaberg (ix-xii).

2. *subreticulatus* sp. nov.

Allied to the preceding but darker; the head narrows more towards the anterior margin and is more acute there. Pale testaceous, very closely and finely punctured and freckled with brownish and golden-yellow. Tegmina with brownish veins.

Head nearly one-half longer than wide, 3½ times as wide as pronotum. Tegmina subreticulate.

Length: 6½ mill.

Hab: New South Wales, Sydney (ii).

3. *trilineatus* sp. nov.

Somewhat similar to the last named; a dark brown line from anterior margin of head to posterior angle of scutellum (divided on vertex by pale median carina); lateral margins of tegmina broadly blackish brown, narrowing a little apically, the margins pale.

Length: 6 mill.

Hab: New South Wales.

Tartessus Stal.

Tartessus Stal, 1865, O. V. A. F., XXII, 156; Signoret, 1880, A. S. E. France, 347.

This is a characteristic Australian genus, though it stretches into the Philippines, Malays, etc. It must be very rich in species as Signoret admits 14, and I have a number before me unworked. They seem all to be arboreal.

1. *syrtidis* sp. nov. (Pl. XXIV, fig. 9).

Pronotum and scutellum clear yellowish. Head testaceous, the top broadly black transversely, lengthening on the tempora; there is a broad curved black stripe at the base of the genae, beneath the eyes, reaching the frontal sutures at the antennal scrobes. The frons has a pattern (figured) in black and the apex of clypeus and of lorae, etc., are the same color. Eyes brown. Sterna (mostly), sternites basally, sternopleurites entirely, posterior femora mostly, genital segments (except lateral margin of plate in male, narrowly pale),black or blackish; rest of underside mostly testaceous. Tegmina subhyaline, pale ferruginous with a lilac iridescence; a transverse median hyaline stripe and a large hyaline, marginal spot towards the apex of the subapical transverse veins, blackish; and a spot near the apex of the costal cell blackish ferruginous. Wings hyaline, veins black. Vertex scarcely prominent in front of eyes, very greatly rounded. Eyes large, reaching posteriorly to about half of the length

of the pronotum. Ocelli much nearer the eyes than the middle line.

Length: (Female) 9 mill.

Hab: Queensland, Bundaberg (xi on sandhills; bred from *Eucalyptus*).

Tribe *Macrostelini.*

(=Cicadulini V. D.)

Under this name it is convenient to separate forms with shorter vertex and simpler venation, usually with only one subapical cell; at the same time it is probably not a natural division. It probably embraces (1) *Balclutha* Kirkaldy, (2) *Macrosteles* Fieber, (=*Cicadula* Edwards=*Limnotettix* Woodworth, etc.), (3) *Coryphaelus* Puton, (4) *Grypotes* Fieber, (5) *Aconura* Lethierry, (6) *Eulcimonios* Kirkaldy (=*Limotettix* J. Sahlb.), and some new genera. *Limotettix* Sahlb., is a mixture of *Phrynomorphus* and *Thamnotettix*. Most, if not all, of these forms are grass-feeders.

Eulcimonios gen. nov.

Jas. Edwards has separated off as a genus (not recognized by Puton) those forms in which the lateral margins of the pronotum are obsolescent and are not (or very obsolescently) keeled. Unfortunately he has used for this the name *Limotettix* (an orthographical monstrosity.) J. Sahlb, the type forms of which are partly *Phrynomorphus*, partly *Deltocephalus*.

The Edwardsian species seem to be worthy of at least subgeneric rank and I think that the future will accord a full title.

1. *demittendus* sp. nov.

Vertex testaceous tinged with brown; 4 brownish specks on apical margin, 2 on basal margin. Pronotum and scutellum testaceous tinged with green. Tegmina greenish, or pale greenish testaceous, apically and costally colorless, veins pale greenish testaceous. Frons pallid rufescent with narrow obsolescent brownish radiating lines from very near the middle line. Vertex angularly rounded in front, about one-half longer medianly than next to the eyes. Lorae very large, almost circular, about 3 times as wide as the clypeus. Tegmina with 4 discoidals and 5 apicals.

Length: $3\frac{1}{8}$ mill.

Hab: New South Wales, Sydney (i).

Pettya gen. nov.

Elongate; vertex more than twice as wide as long dorsally, anteriorly rounded, bent over in front and extending ventrally about as far as antennal scrobes; demarcation from frons not very distinct; posteriorly above tumidly raised, posterior margin much more so than the apical margin of pronotum. Head distinctly wider than pronotum anteriorly. Clypeus oval, about as wide as frons apically. Pronotum large, reticulate, almost as long as wide, about two and a half times as long as vertex dorsally, strongly arched anteriorly, lateral margins long, not carinate, posterior margin subtruncate. Tegmina with two discoidal (1 subapical) and 4 apicals. Wings without submarginal vein.

1. *anemolua* sp. nov. (Pl. XXXII, fig. 10).

Head pale luteous; frons and clypeus with an orange tint, genae testaceous, eyes grey. Pronotum and scutellum greyish white, the former closely reticulate with greyish-brown. Tegmina and wings milk-white hyaline, tegminal costa pale yellow. Tergites black, one or two segments partly pale; beneath pallid, more or less black laterally. Legs orange yellow.

Length: 6 mill, width $1\frac{1}{8}$ mill.

Hab: Queensland, Cairns (viii).

Nesosteles gen. nov.

Allied to *Macrosteles* but the radial is not obsolescent and the wing venation is different. There are a number of species represented in the collection, out of which I have had time briefly to describe 5 only.

Type *hebe*.

1. *hebe* sp. nov. (Pl. XXXII, fig. 8).

Head pale sordid testaceous. Pronotum and scutellum whitish testaceous, with a faint brownish longitudinal median line on the former (and sometimes two obsolescent submedian lines). Underside, legs, etc., pallid. Tegmina whitish-grey, subhyaline, veins white; wings milky white, veins more or less smoky. Mesonotum and tergites blackish, genital segments more or less pale.

Length: 4 mill.

Hab: Viti Isles (viii).

2. *glauca* sp. nov.

Closely allied to the former, but smaller and more yellowish. Pale yellowish testaceous, with a tinge of grey; sterna, legs, etc, paler. Tegmina and wings pale milky subhyaline. Abdomen pale sordid yellowish, more or less black discally.

Length: 3½ mill.

Hab: Cairns (viii), Koebele's No. 2259; and I think 2292 is either this, or a very closely allied species.

3. *sanguinescens*, sp. nov. (Pl. XXXII, fig. 9).

General color dark crimson-red. Head testaceous (or yellowish testaceous or pinkish); vertex with three narrow crimson longitudinal lines ,the lateral ones with a very short transverse line at their apices. Face testaceous, frons with pale red-brown, obliquely transverse parallel lines on each side of the middle. Pronotum testaceous or pinkish with a narrow median longitudinal crimson line, two sublateral outwardly-curved lines of same color and three crimson spots on anterior margin and one in posterior angle, this and the middle anterior one sometimes united: these spots often darker. Tegmina crimson red, varyingly obscurely suffused with brownish, veins white and very conspicuous: Costal and intero-apical cells hyaline, some of the latter more or less smoky. Wing veins darkish. Propleura, sterna etc., abdomen mostly (except the sanguineous lateral margins and genital segments) black. Legs mostly pallid.

Female: Plate testaceous; last segment deeply acutely notched.

Length 4¾-5 mill.

Hab: Queensland, Brisbane (vi), Bundaberg (ix-xii.)

4. *sordidior* sp. nov.

Closely allied to the last, but a trifle smaller, and color different, the sanguineous being paler and browner, while the frons is not striped.

Female: last segment very slightly roundly emarginate.

Length 4½ mill.

Hab: Queensland, Brisbane (vi.)

5. *taedia* sp. nov.

Sordid lemon yellow, vertex with two black spots near the anterior margin; frons discally black, clypeus smoky. Scutellum dark brownish. Commissural cell of clavus, basal part of costal cell and apical half of tegmina smoky. Abdomen basally black.

Length $4\frac{1}{4}$ mill.

Hab: Queensland, Kuranda (viii.)

This will probably form the type of a new genus.

Subfamily Agalliinae.

(Bythoscopidae of many authors.)

I have retained this subfamily for the sake of convenience but I cannot see any good characters by which it can be separated from the Iassinae, especially from such forms as *Tartessus* etc., the position of the ocelli being so slightly different.

The nomenclature is horribly confused, all authors up to 1900 (when I pointed the fact out) having ignored Lewis' fixation of *lanio* as the type of *Bythoscopus*.

The following is the synonymy of several vexed genera:

1. *Bythoscopus* Germar, type *lanio* (Linn.) Lewis.
   Macropsis auct. nec Lewis.
   Batrachomorphus Lewis, type *irrorata* (=*microcephala*)
   Stragania Stal. (placed by Fowler among the *Gyponinae*!)
   Pachyopsis Uhler.
   Gargaropsis Fowler.
2. *Oncopsis* Burmeister, type *flavicollis* (Linn.) Westwood,
   Macropsis (B) Lewis.
   Bythoscopus auctt.
3. *Macropsis* (A) Lewis, type *virescens* (Fabr.) Westwood.
   subg. *Pediopsis* Burmeister, type *tiliae* Burm.

Tribe *Agalliini.*

Epipsychidion gen. nov.

Forms a sort of link between the Agalliinae proper, and the Iassinae as represented by *Tartessus*; it is here placed in the former as the ocelli are ventral though not very distinctly.

Vertex dorsally very short, anteriorly obtuse-angled, pos-

teriorly rotundately-emarginate (apex of emargination nearly reaching as far as anterior margin of eyes), obliquely striate on each side of the middle. Ocelli inserted on the vertex ventrally, immediately below the top of the head. Antennae inserted under a shallow ledge, but lying in a rather deep groove. Pronotum subhemispherical, transversely striate. Scutellum transverse. Tegmina punctured, especially on the clavus; 5 discoidals (of which two are subapical) and 5 apical cells.

1. *epipyropis* sp. nov. (Pl. XXIII figs. 4-6.)

Pale cinereotestaceous, sordid testaceous beneath. Pronotum with 3 distinct, narrow, longitudinal black lines, which continue anteriorly and posteriorly on to vertex and scutellum (the middle one much thickened on the vertex and scutellum and trifurcating anteriorwards on the pronotum.) Clypeus etc., blackish brown, frons obscurely and sparsely marked with brown. Anterior intermediate femora annulated with dark brown. Tegmina with veins white, dark brown and black. Abdomen brownish-testaceous, a blackish brown median line on last tergite.

Male unknown.

Female: Ovipositor extending beyond tegmina, pygofer elongate, but not so long as the above.

Length

Hab: New South Wales, Sydney (i-ii Koebele's No. 2373), arboreal.

Vars: In some examples, the black lines are fainter and are bordered with yellowish brown.

The nymph (fig. 6) has a remarkably elongate head.

Eurinoscopus, gen. nov.

The Australian representative of *Bythoscopus* Germ., Kirk., from which it differs by the venation; the latter has the median discoidal undivided, so that there are only two small subapical cells, while in the former there are three well defined small subapical sells also in *Bythoscopus* there is only one transverse vein standing on the cubital, in *Eurinoscopus* there are two.

There are two sections, viz:

1. Tegmina pale yellowish cinerous (sometimes tinged with green or rose), with blackish granulations on the veins.
2. Tegmina greenish or pale yellowish green, without granulations.

Section 1.

1. *lentiginosus* sp. nov. (type.)

Vertex and pronotum pale greenish, minutely spotted with black, the latter also smokily clouded through its entire length in the middle. Scutellum pale castaneous, with four dark spots on the anterior margin (or the two middle ones may coalesce and extend to the posterior angle.) The rounded frons is blackish, except the lateral margins which are very narrowly pale, and there are two small black spots at the sides of the antennal scrobes below the ledges. Rest of the underside pallid, pleura and base of the genital segments dark, the remainder of the latter minutely spotted with black. Tegmina subhyaline, pale cinereous yellow, (base sometimes more or less black.) Apices or intermediate femora and of posterior femora and tibiae black. Sternites pallid testaceous, greenish or reddish.

Frons convex, lorae large. Pronotum much more convex than in the European *B. microcephala*, and anteriorly declivous, anterior margin more arched, lateral margins shorter; tegmina reaching well beyond apex of abdomen.

Male: Last segment truncate, pygofers very short, valve elongate (the tip black), nearly as long as pygofers.

Female: Last segment subtruncate, very slightly sinuate, pygofers granulate.

Length: 4⅞ mill.

Hab: Queensland, Kuranda (viii), Nelson (vii).

2. *sontiates* sp. nov.

Sparsely freckled, otherwise little related to *lentiginosus*, being more elongate and narrowed. Pale testaceous, more or less tinged with pink or greenish or yellowish green, a longitudinal narrow testaceous line on vertex, pronotum and scutellum. Ocelli red. Frons and lorae much as in the type.

Males rather smaller and darker.

Female: Last pleurite very slightly obtusely produced in the middle, pygofers longer than in the type, with short bristly hairs.

Length: 4⅞-5¼ mill.

Hab: Queensland, Kuranda (viii).

3. *soboles* sp. nov.

Very close to the last, but larger and the anterior margin of vertex (dorsally) wider and not so rounded; frons flatter. Lateral margins of pronotum more parallel.

Length: $6\frac{7}{8}$ mill.

Hab: Queensland, Kuranda (viii).

4. *dryas* sp. nov.

Allied to *E. sontiates*, but less elongate and frons flatter.

Pale testaceous, corium lightly granulate with brown.

Male: Plates elongate hemispherical, not as long as the pygofers.

Female: last segment obtusangularly emarginate, laterally produced acuminately.

Length: $4\frac{7}{8}$-$5\frac{1}{8}$ mill.

Hab: Queensland, Bundaberg (ix-xii).

Section 2.

The species of this section are unsatisfactory; they are all immaculate greenish or testaceous and present only trifling differences that can be characterized.

5. *pelias* sp. nov.

General form of *B. dryas*, but a little more elongate.

Greenish; head and scutellum often yellowish; underside more or less testaceous. Frons convex, though not so much so as in the type. Inner apical cell and appendix colorless.

Male ventral segments similar to those of *B. dryas*.

Female: last segment slightly roundly emarginate, laterally produced acuminately, pygofers elongate.

Length: $4\frac{1}{4}$-6 mill.

Hab: New South Wales, Sydney (i-ii), Mittagong (i).

6. *molestia* sp. nov.

Allied to the last, but narrowed and more elongate; vertex distinctly, though obtusely, angulately rotundate in front; in the middle more than one-half longer than at eyes which extend laterally very slightly beyond the pronotum. Frons nearly as

convex as in the type. There are 3 transverse veins standing on the cubital.

Female: last segment not produced acuminately laterally.

Length: 5 mill.

Hab: Queensland, Kuranda (viii).

7. *pelamys*, sp. nov.

The largest of the Australian species. Similar to *B. pelias* but larger and more elongate.

Testaceous. Frons fairly convex, vertex dorsally short, wide, little wider medianly than at the side.

Female: last segment with a short acute lateral spine.

Length: $6\frac{1}{8}$-$6\frac{7}{8}$ mill.

Hab: New South Wales, Sydney (i).

Pedioscopus gen. nov.

Allied to *Idiocerus* Lewis, but differs by having no subapical cells. There is a tegminal appendix, and the supernumerary cell of the wing is present. In the males the antennae are simple. Frons convex, anterolateral margins rounded. Type *philenor*.

1. *philenor* sp. nov.

Head and pronotum pale greyish-yellow, frons (except narrowly laterally, pallid), clypeus, lorae, small spot at antennal scrobes, etc., blackish. Pronotum with 2 large rounded black spot. Tegmina hyaline, basal half tinged with yellowish; costa, a longitudinal streak down the middle, the principal veins, more or less, smoky. Apex of anterior tibiae and anterior tarsi black.

Male: apex of valve black.

Length: 4 mill.

Hab: Queensland, Cairns (viii).

2. *polydoros* sp. nov.

Larger than the type and differently patterned. Pale olivaceous, paler beneath, four black spots on vertex, the larger pair (which are a trifle less than their own diameter from the eyes) visible from above. Frons with 8-10 small spots. Pronotum with two sublateral blackish wedgelike spots close to anterior margin. Scutellum with two wedgelike black spots on anterior margin close to anterolateral margin, and two small round black

spots on the middle, one on each side of central line. The spots on vertex, pronotum and the wedges on scutellum are in line Tegmina immaculate. A black spot on propleuron.

Female: Ovipositor black, valve much longer than in *P. agenor*, being as long as the rest of the body.

Length: 4 mill.

Hab: Queensland, Nelson (vii).

3. *agenor* sp. nov.

Size and coloring of the type, except as below, and may possibly be the female of that species. Vertex with two black spots nearer the eye than their own diameter and visible from above. Frons with two similar sized spots at its extreme base and nearer together than are the vertical spots; a small spot at the scrobes and the clypeus, black. Pronotum with 2 big black spots (and sometimes a line at the posterior margin). Sterna, a spot on propleuron, etc., black. Anterior tibiae concolorous.

Female: ovipositor black.

Length: 4 mill.

Hab: Queensland, Cairns (viii).

Tribe *Eurymelini*.

Confined to Australia, the species congregate on *Eucalyptus* where they "bore into the green bark....the sap exudes, dies and falls to the ground, sometimes in great quantities," (Ann. Mag. Nat. Hist., XV, 35, (1845).

There are only two genera known, one forming two subgenera:

1. Tegmina with simple venation and with an appendix; wings with normal venation. Vertex and frons forming one single curve, in profile. Posterior tibiae with a double row of spines. Last abdominal sternite composed of two parts which overlap posteriorly but are separated anteriorly; they reach the lateral margins of the abdomen. 1. *Eurymeloides* Ashmead.

1a. Tegminal venation reticulate apically; wings with two veins inside the supernumerary cell. Vertex and frons forming two or three curves in profile. Posterior tibiae with two strong spines. 2. *Eurymela* Lep. & Serv.

1b. Last abdominal sternite formed as in *Eurymeloides*. 2a. *Eurymelops*, subg. nov.

1c. Last abdominal sternite consisting of two similar plates, which however do not nearly reach the lateral margins of the abdomen. 2b. *Eurymela*, in sp.

Eurymeloides, Ashmead.

Eurymela Div. B. Signoret.

Eurymeloides Ashmead, 1889, Ent. Amer., V, 126.

Ashmead has founded this genus in the most improper manner, viz.: in one line of description, without mention of species. The venation both of tegmina and wings is often very irregular. Usually there is one vein standing on the cubital, sometimes two, sometimes none at all, in the same species. Sometimes the transverse apical veins are incomplete, a cell thus reaching from the first forking of the median to the apex of the tegmen.

1. *hyacinthus* sp. nov.

Black; eyes pale castaneous. Posterior margin of pronotum, a small spot (of varying size) on clavus, a larger (though still small) spot on corium about the apex of the basal third, and a more of less narrow wedge-shaped band of varying thickness and extent (sometimes reaching clavus, sometimes not) on corium at a level with apex of clavus, white. Tegminal ground color dark metallic purple, wings dark smoky. Posterior part of scutellum (or only the lateral margins very narrowly) ochraceous. Lateral margins of frons, lateral margins of lorae and interior margins of genae, coxae, sternites (excluding genitalia), tergites broadly postero-laterally, and middle two-thirds of basal segment of posterior tarsi—whitish testaceous.

Length: $10\frac{1}{2}$-12 mill.

Hab: Queensland, Cairns (vii-viii), Nelson (vii), Kuranda.

Var: A narrow longitudinal stripe on vertex and two small spots near anterior margin of pronotum, ochraceous.

Nymph. No chitinous spines on the legs, only short, feeble hairs. Vertex, two spots on pronotum, the ground color of nota and abdomen above castaneous; frons, lorae, clypeus, rostrum, sternites, black. Genae pallid. Nota and terga marked with black.

2. *cumulosus* sp. nov.

Head, pronotum and scutellum blackish brown, speckled with testaceous; posterior two-thirds of genae and exterior half of

lorae, whitish, more or less punctured finely with brownish red. Tegmina blackish brown, a white blotch near the base (with a black speck in the middle), an irregular stripe near the apex and one or two small spots near the commissure. Wings smoky, veins black. Legs black, coxae, base of femora, base of spines on posterior tibiae, and basal four-fifths of 1st. segment of posterior tarsi, whitish. Abdomen pale yellowish, genital segments black. Penultimate sternite obtusangularly emarginate, pygofers rather short and stout.

Length: 8½ mill.

Hab: Queensland, Brisbane (vi).

Var: I have in my own collection, some forms from Queensland, which I can only refer to this species; the head and pronotum are more irrorated with testaceous. Scutellum ochraceous irrorated with black, the anterolateral angles black. The tegminal veins are pinkish where they cross over the whitish fasciae. Abdomen sanguineous, genital segment black.

3. *bicinctellus*, sp. nov.

Closely allied to *E. bicincta* (Erichson). Shining black; posterior three-fourths of genae, exterior half of lorae, the coxae, basal three-fourths of femora, base of tibial spines, basal two-thirds of 1st. segment of posterior tarsi, testaceous. Posterior margin of pronotum very narrowly, an oblique stripe from about middle of costa to middle of lateral margin of scutellum, and another band (narrowing internally) near apex of tegmina, white. Wings smoky, veins black.

Male: Sternites black, posterior margin of each narrowly testaceous, last segment with a large testaceous triangle. Genital segment black.

Female: Sternites pale testaceous, genital segment black. Last segment very short, almost concealed by previous one, apically sinuate, medianly notched.

Var: Dark parts of head, pronotum and scutellum more or less, or entirely, castaneous.

Length: 6½-7¼ mill.

Hab: Queensland (my collection), New South Wales, Mittagong (i).

4. *ornatus*, sp. nov.

Allied to *E. cumulosus*. Head and pronotum dark brown mottled with whitish. Exterior half of lorae whitish. Scutellum

pale castaneous, with a broad central stripe (becoming obscure anteriorly) and the anterolateral angles blackish. Pleura black, propleura bordered narrowly exteriorly with whitish. Sterna, coxae, basal part of femora, tibial spines basally, basal three-fourths of 1st. segment of posterior tarsi, sternites (except some black markings) testaceous. Tegmina, purplish black, picturation as in *E. bicinctellus* but broader and the basal stripe more transverse, reaching only to about one-third of costal length. Wings as in *E. bicinctellus*.

Male: Genital segment more elongate dorsally than in *E. bicinctellus*.

Length: 8¾ mill.

Hab: Queensland, Cairns (viii).

5. *rubrivenosus*, sp. nov.

Head, pronotum and scutellum pale castaneous, freckled with yellow. Clypeus, lorae and underside yellow; tibiae and tarsi more or less castaneous. Tegmina subhyaline yellowish, the cells more or less obscurely clouded with brownish, veins sanguineous, also most of clavus. Wings smoky, veins black.

Female: Last segment notched sublaterally; pygofers elongate.

Length: 5¾ mill.

Hab: New South Wales, Mittagong (i).

6. *lentiginosus*, sp. nov.

Very closely allied to the preceding but much narrower posteriorly, more triangular in form. Head and pronotum more or less marked with black. Tegmina yellowish cinereous, more or less infuscate towards the apex, with a few translucent, colorless markings; principal veins sometimes pale sanguineous.

Length: 5-5⅔ mill.

Hab: Queensland, Brisbane (vi).

7. *pulchra* (Signoret).

Eurymela pulchra Signoret op. c., 508, Pl. 17, f. 10.

Hab: Victoria, Bacchus Marsh (my collection).

The following species of *Eurymeloides*, described from Australia, are unknown to me:

8. *Eurymela lineata* Signoret, 509, fig. 11.

9. *E. adspersa* Signoret, 510, fig. 2.
10. *E. ocellata* Signoret, 511, fig. 13.
11. *E. punctata* Signoret, 511.
12. *E. trifasciata* Signoret, 512, fig. 14.
13. *E. porriginosa*, Signoret, 512.
14. *E. bicincta* Erichson, 1842, Wiegmann's Archiv., VIII, 286. (The type of the genus).

Eurymela Lep. and Serv.

Eurymela Lep. Serv., 1825, Enc. Meth., X, 603.
Eurymela Div A., Signoret, 1850, A. S. E. France, (2), IX, 497.

subg. 1. *Eurymelops*, nov.

1 *rubrovittata*, Am. & Serv.

Eurymela rubrovittata Am. Serv., 1843, Hem. 555, Pl. 10, fig. 4.
Hab: Victoria, Bacchus Marsh (my collection).

2. *bicolor*, Burmeister.

Eurymela bicolor Burm, (1837?) Gen. Ins., *Eurymela* No. 1. Signoret, 1850, A. S. E. F., 503, Pl. 17, f. 9.
I do not know this species.

subgenus, *Eurymela* in spec.

3. *rubrolimbata*, sp. nov.

Allied to *E. bicolor*. Black or blackish; posterior margin of genae more or less widely pale reddish. Trochanters, basal half of femora (or almost all posterior femora), tibiae (mostly), claval commissure and costal margin (both narrowly) reddish. Tegmina purplish black, a stripe across middle of clavus, and a subcontiguous one across the corium, also a broader one nearer the apex, white.

Male: last sternite slightly roundly emarginate, genital segment somewhat elongate.

Female: penultimate sternite obtusangularly emarginate, last sternite truncate.

Var: Posterior half of pronotum lemon yellow, encroaching medianly on black anterior half.

Length: 9½-9¾ mill.
Hab: New South Wales, Mittagong (i).

4. *plebeia* sp, nov.

Allied to *E. fenestrata*. Castaneous or orange; vertex with a short stripe on each side of the base of the frons, 2 spots on pronotum (sometimes absent, sometimes much enlarged), 3 spots at apical margin and at posterior angle (sometimes concurrent), apex of femora, the tibiae and tarsi (except the white basal three-fourths of basal segment of posterior tarsi), propleura more or less, etc., black. Genae and lorae testaceous. Tegmina purplish or purplish black, sometimes with a greenish glint, lateral margins narrowly ochraceous, widening basally, internal margins more or less widely coppery; a white spot near costal margin at about third of its length, and another one nearer apex, also a speck on clavus (sometimes absent.) Wings smoky black with purple glint; veins black. Abdomen more o less tinged with sanguineous.

Male: Genital segment black.

Female: Genital segment orange, apex and last segmen (plates) blackish.

Length 12½ mill.

Hab: Victoria, Bacchus Marsh (my collection).

5. *lubra*, sp. nov.

Allied to *E. distincta*, from which it apparently differs principally by the red abdomen, etc.

Head, pronotum, scutellum, tegmina, etc., metallic purplish black; genae and exterior half of lorae testaceous. Abdomen above and the whole of the underside sanguineous, except part of propleura, apex. of femora, the tibiae and tarsi (except the pale basal three-fourths of 1st segment of posterior tarsi) which are black. A spot near the base of tegmina and a little one (contiguous) on clavus, and one near apex of tegmina—white.

Male: Genital segment black, more or less sordid ochraceous laterally.

Female: Genital segment sanguineous; last segment (plates) and apex of genital segment, black.

Length 13-14½ mill.

Hab: Victoria, Bacchus Marsh (my collection).

dula Puton etc., should be employed *Macrosteles* Fieber.

The following table shows the affinities of the genera:

(*Motschulskyia* Kirkaldy =*Conometopus* Motschulsky, is not included.)

1 Median and cubital veins united by a short stalk basally and apically........................1 *Ancono* gen. nov.
1a Corial veins not forked..............................2
2 Membranal appendix present.........................3
2a Appendix absent....................................4
3 Complete submarginal wing vein....................
....................2 *Alebra* Fieber (=*Compsus* Fieber)
3a Wing with obsolescent submarginal vein (Sec. Baker)..
............................3 *Protalebra* Baker (X)
4 Complete submarginal wing-vein.....................5
4a No submarginal wing-vein..........................9
5 Three apical wing cells (Sec. Baker)....4 *Eualebra* Baker
5a Two apical wing cells.............................6
5b One apical wing cell..............................8
6 Third wing vein forked............................7
6a Third wing vein simple...........7 *Cicadula* Zetterstedt
7 At least two of the apical cells of tegment springing from the transverse veins..........5 *Dikraneura* Hardy (subgenus 1 *Erythria* Fieber =*Notus* Fieber.)
7a Only one of the apical cells springing from the transverse veins......................6 *Kahaono* gen. nov.
8 Face of the usual type................8 *Empoasca* Walsh
8a. Frons narrowing basally, meeting at the base in an acute angle; medianly carinate; lorae very elongate..
...............................9 *Heliona* Melichar
9 First two wing-veins subparallel...................
............10 *Eupteryx* Curtis, (=*Typhlocyba* Germar)
9a First two wing-veins confluent towards apex..........10
10 Second apical cell pedicellate, third irregular........
..11 *Empoa* Fitch (=*Typhlocyba* Puton=*Anomia* Fieber.)
10a Second apical cell not pedicellate, third oblong........
..12 *Erythroneura* Fitch (=*Zygina* Fieber=*Idia* Fieber.)

Aneono gen. nov.

Differs from all other Eupteryginae by the venation of the tegmina, which is best explained by the figures. It is remark-

* It is a pity that Baker has applied the misleading term '*Protalebra*' to this genus, as it is evidently a derivative of that genus or some ally not a precursor.

able not only for the distinctness of the veins at the base of the tegmina but for their forkings and anastomosings, thus connecting the last described tribe with the typical Eupteryginae.

Head sub-foliaceous, produced in front of the eyes, roundly arched. Ocelli probably functionless, but vestiges large, dorsal, close to the anterior margin, nearer to one another than to the eyes. Apex of first segment of antennae reaching to lateral margin of head. Vertex long and narrow. Tegmina without an appendix. The radial vein seems to lose itself in the costal; the median and cubital have a short common stem and unite again in a short stem just basal of the apical cells. There is a discoidal cell. The median and cubital are the most distinct of the veins. (Pl. XXII, fig. 12, and Pl. XXXI, figs. 2 and 3).

1. *pulcherrima* sp, nov.

Vertex and pronotum bright orange yellow, the former tinged with pink, and with a broadish longitudinal pallid stripe, anterior (dorsal) margin also more or less pallid narrowly. Pronotum with a narrow longitudinal stripe, a dot on each side of this anteriorly, and a ? and ? laterally about the middle, pallid. Posterior margin very narrowly pallid. Scutellum reddish, posterior lobe blackish with two white spots. Basal two-thirds (or more) of tegmina rich crimson, darker on the clavus exteriorly; wedge on the clavus and the part of the corium between the cubital and median veins hyaline and somewhat infumate; 2 short wavy whitish lines on clavus and 2 white marks on corium, one (with a black spot at its apex) close to apex of clavus, the other at apex of area between median and cubital veins. Apical third of tegmina hyaline, more or less tinged with yellowish. Wings milkwhite, veins pale yellow. Underside pale testaceous or yellowish; frons more or less tinged with orange; basal sternites of abdomen more or less blackish.

Vertex between the eyes two-fifths wider than medianly long, base roundly emarginate. Pronotum transverse, subquadrangular, same length as head, posterior margin almost straight. Scutellum as wide as vertex between eyes and as long as pronotum, acuminately produced posteriorly, transversely sulcate near the posterior angle.

Female: Sheath at least 7 times as long as the ultimate abdominal sternite (which is sinuately excavate), with short white bristly hairs.

Length 3-3½ mill.

Hab: New South Wales, Sydney (i) Queensland, Bundaberg (ix-xii).

The clavus is much darker (red-black) in the Bundaberg specimens. One of the Sydney specimens is the type.

Dikraneura Hardy.

Dikraneura Hardy 1850 Tr. Tyneside Field Club I 423.
Dicraneura Gillette 1898 P. U. S. N. Mus, XX 715.

1. *honiala*, sp. nov.

Superficially not unlike *D. flavipennis* (Zett.), but with a more elongate crown, etc.

Head, pronotum, scutellum and general ventral aspect, immaculate pale brownish-yellow; eyes blackish grey. Tegmina pale golden yellow, shining; a black spot at the apex as in *D. unipuncta* (Gillette), but ringed around with whitish, 1st apical cell whitish narrowly ringed with brownish; a small oblique brownish black line from costa inwards at about the middle. Wing-veins pallid. Legs immaculate pale yellow, hairs whitish.

Vertex subconvex, elongate triangular, longer than the pronotum, posteriorly roundly emaginate. Pronotum posteriorly truncate. Venation of tegmina very similar to that of *D. unipuncta* as figured by Gillette, except that the corial veins are entire and distinct and that the first apical cell is 5-sided rather than 3. Alar venation more like that of *D. carneola* (Stal) as figured by Gillette, but the submarginal vein is entire and unbroken.

Female: Ovipositor and pygofers longer than the rest of the abdomen.

Length $3\frac{3}{4}$ mill.

Hab: Queensland, Kuranda (viii).

2. *aneala* sp. nov.

Vertex, frons, pronotum and scutellum orange brown, the two latter obscurely so. Eyes blackish, genae etc., mostly dark. Tegmina pale greenish yellow, apical cells dilute smoky. Wing-veins brownish. Abdomen striped transversely black and grey. Genital segments palid. Legs with pale hairs.

Tegminal venation similar to that of the preceding, except that the 1st apical cell is 4 sided (the basal margin being slightly

obtuse angled), the interior margin almost as long as the apical margin, the costal and interior margins being subparallel. Alar venation as in *D. unipuncta.*

Female: Last sternite somewhat deeply roundly biemarginate.

Length 3 mill.

Hab: New South Wales, Sydney (ii).

Kahaono gen. nov.

Allied to *Dikraneura* Hardy, but the apical cells of the tegmina arranged more as in *Ancono* Kirkaldy. Head produced before eyes a little inflatedly, rounded apically. Head and eyes wider than pronotum, the latter arched anteriorly, one-half longer than the head. Tegmina without appendix; only one longitudinal apical vein emitted from the transverse apical veinlets, this forking into three at about its middle, thus forming 4 apical cells. Wings with submarginal vein entire, though faintly marked apicosuperiorly; third vein forked; 2 apical cells.

1. *hanuala,* sp. nov.

Head, pronotum and scutellum sordid testaceous; underside and legs pallid. Tegmina subhyaline, milky; clavus more or less clouded with pale brownish, a milky spot towards the apex; corium more or less clouded with pale brownish basally, a brownish curved line running to apex and giving out 3 brownish lines costally and 2 or 3 clavally, at more or less regular intervals.

Length: $3\frac{7}{8}$ mill.

Hab: Queensland, Brisbane (vi).

Cicadula, Zett.

Cicadula Zetterstedt, 1838, Ins. Lapp., 296; J. Sahlberg, 1871, Not. faun. Fenn., (2), IX, 158.

Kybos & Chlorita, Fieber, etc.

The following species belong by the venation to the group *Chlorita* as figured by Fieber, (1866).

1. *histrionicula,* sp. nov.

Head pale lemon yellow, vertex almost entirely occupied by 2 large subcontiguous subquadrangular blackish spots. Prono-

tum blackish, lateral margins and sides pale lemon yellow. Scutellum blackish. Sterna, sternites and tergites pale lemon yellow, a spot about the middle and most of the posterior half of the latter (including genital segments) blackish; genital segments beneath greenish, apical ⅔ of pygofers black. Tegmina pale yellow, apical ⅔ of clavus, a patch near the middle of the corium and the exteroapical third of corium, blackish. Wing veins brownish.

Female: Valve deeply narrowly notched, posteriorly rounded on each side of this; pygofers long and narrow.

Length: 2½ mill.

Hab: Queensland, Bundaberg (ix-xii).

2. *vitiensis*, sp. nov.

Lemon yellow, more or less suffused with greenish; vertex castaneous, or sordid yellowish; frons sordid yellowish, a blackish line at anterior margin of head between the eyes and another narrower, curved one near base of frons. Tegmina lemon yellow, suffused with green or with orange, with a brownish black line from apex of clavus to costa curving a little downwards, veins apical to this the same color, first apical vein thickened as regards the color. Underside, large, etc., pale greenish. With veins more or less brownish.

Length: 3 mill.

Hab: Viti Isles (iii).

Eupteryx, Curtis.

Eupteryx, Curtis, 1833, Ent. Mag., I, 192.

The tegmina are unfortunately a little mutilated, but I think the following species may be placed here.

1. *haematoptilus*, sp. nov. (Pl. XXXI, fig. 6.)

Head, pronotum, genital segments, etc., dark, immaculate, blood red, little paler beneath. Eyes black. Scutellum pale luteous. Tegmina subhyaline, more or less tinged with reddish yellow; costal area, apical three-fifths of clavus, a narrow transverse fascia at apical veins, and almost all the veins, more or less blood red; a blackish red spot at the apex of the costal area; the base of the 4th apical area very narrowly, and the apex of the apical areas more or less, infumate. Abdominal tergites

blackish, more or less pale reddish in the middle. Underneath (except as above mentioned) and legs pale testaceous. Saw black. Vertex a little narrower at base than an eye, hemispheric, slightly convex, length and breadth equal (measured as far as the ocelli), lateral margins straight, very slightly divergent. Frons very convex, narrowly elongate. Ocellar rudiments large. Pronotum about as wide as head and eyes, lateral margins short. Tegmina elongate, evenly rounded at the apex. Venation on colored part of tegmina very indistinct, there are 4 apical cells the apical parts of 3 corial cells. A diagrammatic sketch of a tegmen is appended, showing that the venation is not similar to any other described *Eupteryx*. Apart from this the species is easily recognized by the coloring and by the big eyes.

Female: Genital segment at least 4 times as long ventrally as the white, ultimate abdominal segment, which is apically truncate.

Length: 4 mill.

Hab: Queensland, Redlynch (vii).

N. B. For *Eupteryx picta* Melichar, (nec Fabricius, Curtis), a Sinhalese species, I propose the name *Eupteryx melichari*, n.n.

Empoa Fitch.

Empoa Fitch, 1851. Hom. N. Y. Cab., 63.

Typhlocyba auctt.

Gillette has evidently wrongly identified *Typhlocyba commissuralis* Stal which belongs to *Cicadula* (typical subg.=*Kybos* Fieber) and has a quite different wing venation to *Typhlocyba* Gillette (i. e. *Empoa*).

E. australensis, sp. nov.

From very like that of *E. rosae* (Linn.) but the head is less angular apically and the pronotal sides shorter. Vertex pale sanguineous with a long line (widening basally) and two irregular wedges near the apical margin (more or less irregularly), a longitudinal line (narrower apically) and the posterior margin), greyish. Scutellum white, a pale orange square on basal two-thirds, apical third with a blackish longitudinal line and a black spot on posterior angle. Tegmina orange, crimson, cinerous, dark brownish and whitish. Basal half of clavus, pale orange with a white spot; apical half whitish, extreme apex faintly

orange. Basal third of corium whitish, extreme base sanguineous and orange. Middle third more or less crimson, a whitish spot at its apex; apical cells whitish, the veins and the transverse veins pale cinereous. Underside more or less dark brownish, face paler. Pronotum a trifle longer than the head. Tegmina with four apical cells, the third being sub-parallelsided and oblong. Basal of the apical cells, the veins are more or less obsolescent. Wing venation as in *E. rosae*.

Length: (female) $3\frac{1}{4}$ mill.

Hab: Queensland, Brisbane (vi).

Erythroneura Fitch.

Erythroneura Fitch, 1851, Hom. N. Y. Cab., 62.

Zygina Fieber, etc.

Typhlocyba (part) auctt.

1. *melanogaster*, sp. nov.

Head sordid-brown, darkening at the anterior margin of vertex, the posterior margin paler. Pronotum creamy, the posterior third (produced medianly forward) greyish; anterolaterally a curved black line on each side. Scutellum more or less sordid yellowish, anterolateral angles widely black. Tegmina subhyaline. Clavus and costal cell pale yellowish brown. Wings iridescent, veins pale brown. Legs pallid. Abdomen black. Vertex about as wide as an eye.

Length: 3 mill.

Hab: New South Wales, Sydney (i.)

2. *lubra* sp. nov.

Pale yellowish, rather sordid; rostrum pale ferruginous. Tergites (except genital segment and narrowly laterally) black. Tegmina hyaline milky, veins pale yellow. Vertex at base wider than an eye.

Length: 3 mill.

Hab: New South Wales, Sydney (i.)

The following three species are typical *Zygina*, having only 3 apical cells to the tegmen.

3. *honiloa* sp. nov.

Pale golden yellow. Eyes blackish. Tegmina apically, etc., more or less hyaline, veins of wings pale yellowish. Head convex, anteriorly rounded, shorter than pronotum. Tegminal veins all distinct.

Male: I think the valve is absent, but the genitalia in the 4 males seen are shrivelled.

Length: 2½ mill.

Hab: Queensland, Bundaberg (ix-xii)

4. *ipoloa* sp. nov.

Pale yellowish cinerous, paler beneath; eyes, and a large spot on the anterior margin of vertex, black, the latter irregularly encircled by a faint brown halo; a transverse brown stripe, widening medianly, on the pronotum close to the posterior margin. Scutellum and rest of pronotum more or less sordid. Tegmina hyaline, costally smoky; wing veins smoky. Abdomen (except the pallid genital segments) more or less pale sordid brownish (male) or brownish black (female). Vertex roundly triangular, about same length as pronotum.

Length: 2½ mill.

Hab: Queensland, Cairns (viii.)

5. *honiala* sp. nov.

Allied to *E. honiloa* but paler and head rounder and blunter. Testaceous, veins pale orange; costal vein more or less pale orange sanguineous.

Length: 3 mill.

Hab: New South Wales, Sydney (i).

Gen. (?) sp. nov.

The wings in both specimens are too far mutilated to fix the genus of this small yellowish form from Sydney (1).

Subfamily Ledrinae.

Characterized by the ocelli being placed on the disk of the vertex; the subfoliaceous or foliaceous posterior tibiae which are tricarinate, and armed anteriorly with strong spines; and

6. *horrendus*, sp. nov. (Pl. XXXI fig. 13.)

Pale olive brown, mottled on head and pronotum with pale olive green. Scutellum pale greenish. Vertex shorter than pronotum, former obtusely angulate.

Length: 6½ mill.

Hab: Queensland, Kuranda (viii.)

7. *viridescens*, sp. nov. (Pl. XXXI, fig. 12.)

Dull green, head tinged with yellowish, pronotum and tegmina more or less obscurely mottled with yellow. Vertex about the same length as the pronotum or a trifle longer, apically rounded.

Length: 7¼ mill.

Hab: New South Wales, Sydney (ii.)

A nymph from Mittagong (1) closely resembles this.

Other described species are:

8. *R. cuneatus* Walker 1862 Journ. Ent. 1, 319, Pl. XV, fig. 5, (not "6" as in text.) Queensland, Moreton Bay.

9. *Rhothidus navicula* Stal. 1865 O. V. A. F. XXII, 157.

10. *R. convivus* Stal. l. c., Moreton Bay.

11. *R. leucostictus* Stal. l. c., N. Australia.

12. *R. breviceps* Stal. l. c., S. Australia.

Subfam. Stenocotinae.

This subfamily is characterized by the peculiar shape of the vertex and by the ocelli being placed in cavities on the anterior margin (viewed dorsally) of the head; the posterior tibiae are quadricarinate with 6 strong spiniferous spurs on the outer margin, shortly but strongly spined on the upper margin, and feebly bristled on the others.

Stal includes this in his heterogeneous Ledrina, the typical form of which however has the ocelli on the disk of the vertex. To the Stenocotinae belong *Stenocotis* Stal., and two new genera, viz: *Smicrocotis* and *Kyphocotis*; the general venation is that of *Ledra*.

1. Scutellum plane 2
1a. Scutellum acutely cristate .... 3 *Kyphocotis*, gen. nov.
2. Vertex somewhat re-curved ...... 2 *Smicrocotis*, gen. nov.
2a. Vertex plane .... 1 *Stenocotis*, Stal.

All the forms are arboreal.

Stenocotis Stal.

Ledra (part) Walker 1851 List. 809-30.
Stenocotis Stal. 1854 O. V. A. F. XI, 254; and 1856, op. c., XIII, 67, (type *subvittata* Stal.)

Head short, flat, horizontal, anterior margin obtuse-angularly produced, acute, carinate, the keel forking on each side of the middle and reuniting nearer the eyes, thus enclosing a short, narrow, suboval area in the middle of each anterolateral margin, in which the ocelli are placed. Posterior margin angularly emarginate, the middle of the pronotum anteriorly much anterior to the apical margin of the eyes. Eyes oblique, reniform, longer than wide, extending laterally farther than the pronotum. Vertex longitudinally striate, pronotum transversely so, but anteriorly sublongitudinally. Scutellum transversely striate. Frons slightly convex, antennal ridges not deep, lorae and clypeus elongate. Pronotum about as long as wide, much longer than the vertex medianly, flat in front, raised posteriorly, lateral margins straight, subparallel, posterior margin obtusely emarginate. Tegmina extending farther posteriorly than the abdomen in the male, not so far in the female; clavus with the usual veins and also with some transverse veins connecting axillary with commissure and one connecting anal with the suture near the apex. In the corium, the medioradial forks near the base, the median being joined almost immediately to the cubital by a transverse vein. There are 5 discoidals of which two are subbasal and 3 subapical. There are a number (at least 10?) of apical cells, all much longer than wide, in some species many of them forked and many divided transversely. Tibiae dilated.

A number of species have been described by Stal and Walker, but there are probably several synonyms among them, as the sexes are apparently dissimilar. The specimens collected by Koebele and Perkins seem to belong to *S. planiuscula* Stal.
made.

1. *planiuscula* Stal. (Pl. XXV, figs. 3-8.)

Stenocotis planiuscula Stal. 1854 O. V. A. F., XI, 254.
Nymph: In my own collection, I have 3 examples, from Victoria, of nymphs that I doubtfully refer to the same species; they at least belong to this genus. The whole insect is very flat, the head is enormously arched, the anterior margin of the vertex being roundly angular. Just above the eye, it is deeply emarginate, forming a spine. Vertex longitudinally sulcate, base obtusangu-

larly emarginate. The frons apically and apicolaterally somewhat widely foliaceous, rostrum reaching to apex of posterior coxae.

The other described forms, all from Australia, are:

2. *Ledra corticalis* Walker, 1851, List. 814.
3. *L. ferruginea* Walker op. c., 817 (Tasmania.)
4. *L. depressa* Walker, l. c., (Tasmania, South Australia)
(=*Stenocotis subvitt ta* Stal. 1854 O. V. A. F., XI, 254.
(=*Ledra delineata* Walker 1858 Suppl., 250.)
5. *Ledra varia* Walker, 1851, List, 819 (Tasmania.)
5. *L. costalis* Walker, op. c., 821.
7. *L. claudenda* Walker, 1858, Suppl., 359 (Queensland.)

Smicrocotis gen. nov.

Allied to the preceding, but the head is somewhat recurved, the frons more convex and the striation on head and pronotum much coarser, the venation different, etc.

Vertex very narrow, the basal margin not so emarginate as in *Stenocotis*, apical margin only slightly arched, recurved, the longitudinal (suboblique) striations very coarse; ocellar grooves shorter and rounder; frons more convex, antennal ridges thicker. Pronotal striations coarser. Tegmina with 5 discoidals (2 basal and 3 subapical; the latter quite different.)

1. *obscura*, sp. nov.

Dark brown, irrorated with black (which forms several more or less distinct longitudinal lines on the pronotum.) Frons basally blackish brown. Tegmina pallid, mottled closely with brown and brownish black.

Length: 10 mill.

Hab: Queensland, Cairns (viii.)

Nymph: (?belonging to this genus.) Head produced in front, then diverging rapidly posteriorly, longitudinally carinate, spinosely produced just above the eye. Posterolateral angle of pronotum spinose.

Hab: New South Wales, Sydney (ii.)

Kyphocotis, gen. nov.

Closely allied to *Stenocotis* but the posterior three-fifths of the scutellum are elevated in a narrow, acute crest, which in profile is more or less rounded.

(1. *tessellata*, sp. nov. (Pl. XXV, figs. 1-2.)

Dark brown, more or less tessellated and marmorated with pale golden and pale brown; apico-exterior third of tegmina subhyaline, more or less cinerous. Femora annulated with black. Vertex a little recurved, very narrow.

Male unknown.

Female valve as in *Stenocotis*.

Length: 12 mill.

Hab: Queensland, Bundaberg (xi.)

Subfam. Kahavaluinae.

Kahavalu, gen. nov.

This seems somewhat near *Ulopa* Fall (a Membracid) on the one hand and *Megophthalmus* Curtis, on the other. It is distinguished by the ocelli being each in a groove on the rounded anterior margin of the vertex; the pronotum very slightly sinuate posteriorly, not carinate and no process; scutellum free. Head pronotum, scutellum, clavus etc., deeply and closely punctured, making them rugose, a shining point at the bottom of each puncture. Vertex short, transverse, flattened, except at the lateral angles. Eyes large, not forming part of the curve of the head. At the anterior margin of vertex there are two elongate grooves, reaching almost to the eye laterally, but not touching medianly. At the extreme interior part of each of these is an ocellus. Frons rather narrow, elongate, slightly convex, lateral margins gently rounded; antennae in a deep groove near the base. Clypeus not carinate.

1. *gemma*, sp. nov.

Black; the punctures with a sparkling point at the bottom. Cells of the tegmina hyaline.

Hab: New South Wales, Sydney (i).

Length: $2\frac{7}{8}$ mill.

Fam. 2. Membracidae.

This family which contains, or rather consists of, forms that are among the most bizarre of all the Hemiptera, was briefly tabulated generically by Stal in 1868. The Australian forms were well monographed by Goding two years ago, but unfortunately

about the same time, Buckton published a large work, entitled "A monograph of the Membracidae."* which is simply an unsystematized account of the forms he had seen and is in many parts a needless and costly re-hash of Fowlers' work in the 'Biologia Centrali-Americana.'

With very few exceptions, all the Australian Membracids appear to be Centrotine. The family is, as pointed out by Stal and later by Hansen, certainly Tetigonioid (probably via forms related to the *Agalliinae*, via *Acthalion*) and the majority of authors are assuredly wrong in placing them between Fulgoridae and Cicadidae (with neither of which families have they any connection, except that they are all trimerous) and removing them from the vicinity of the Tetigonioidea, their rightful position. There is a single (introduced) Hawaiian species, probably a *Centrotypus.* The males are often appreciably smaller than their females.

I have determined 8 genera and 16 species, of which, I suppose one genus and nine species to be undescribed; there are also a number of small species, probably near *Centrotypus,* that I cannot satisfactorily identify generically at present and have left undone until further opportunity for work or some material for comparison is at hand. The Centrotinae are very difficult to work out, and the difficulties have not been lessened by Buckton's work.

Gelastorrhachis gen. nov.

Allied to *Eutryonia* Goding**, but differs by the following characters:

Pronotum much less widened posteriorly and is mediolongitudinally *strongly carinate* throughout its entire length (including processes), not sulcate; anterior process much more highly elevated and differently shaped, posterior process about as long in *Eutryonia* but follows the curve of the tegmina and its tip is contiguous with them. Venation different. Type *diadema.*

There are two species:

1. Lateral forking of the anterior process of the pronotum extending beyond the rest of the width of the insect.......... .... *diadema,* sp. nov.

2. Pronotal process bulbous at its tip, lateral processes small.. *clavata,* sp. nov.

* I am much indebted to Mr. D. L. Van Dine for procuring me the loan of this work, from the library of the Division of Entomology at Washington. Since the above was in print, I have learnt of the death, at an advanced age, of Mr. Buckton, and consequently have modified my original remarks on his work.

** 1903 P. Linn. S. N. S. W., XXVIII, 6 Pl. 1, fs. 10 and 11 (not 22 which refers apparently to *Eufrenchia*). The venation of f. 26 does not accord with that of f. 10.

1. *diadema*, sp. nov. (Pl. XXX, figs. 2 and 3.)

Furnished with yellow pubescence; piceous brown, anterior process of pronotum and posterior half of posterior process threaded with reddish; pronotal keels mostly reddish; anterior half of posterior process pale flavous. Beneath blackish, legs pale yellowish fulvous. Tegmina ferruginous, paler apically; clavus more or less hyaline, iridescent medianly, a small hyaline spot near the apex.

Length: (female) 5 mill; height 4¾ mill; width across processes, 2 mill.

Hab: Queensland, Kuranda (viii) on a tropical tree.

2. *clavata*, sp. nov. (Pl. XXX, figs. 4-5.)

Color as in *G. diadema* but legs ferruginous. Pronotal process slightly bulbous at the tip, with a short acute spine on each side of the bulbous part.

Length: (female) 5 mill; height 4 mill; width across processes 1¼ mill.

Hab: Queensland; Kuranda (viii.)

Zanophara Kirkaldy.

=*Daunus* Stal 1866 Hem. Afr. IV, 87; Goding 1903 P. Linn. Soc. N. S. W. XXVIII, 30; Buckton (par?)

=? *Ceraon* Buckton 1903 Mon. Membrac, 228.

=*Zanophara* Kirkaldy 1904, Entom. XXXVII, 279.

1. (?) *tasmaniae* (Fairmaire).

Centrotus tasmaniae Fairmaire 1846 Ann. S. E. France, IV. 513, Pl. 3, f. 15.

Daunus tasmaniae Goding 31 pl. 1, fs. 6 and 20 (tegmen and nymph).

? *Centruchoides tasmaniae* Buckton 1903 Mon. Membr. 227 pl. 227, pl. 1, f. 6.

A single female from New South Wales, Mittagong (1), arboreal, which I refer somewhat doubtfully to this; Fairmaire's type was from Tasmania. Buckton's *Centruchoides tasmaniae* sp. nov., from Victoria is either this or a new species of slightly paler color.

2. (?) *vitta* (Walker).

Centrotus vitta Walker 1851 List. Hom. 626.
Daunus vitta Goding, 32 Pl. 1, f. 25 (Tegmen).
? *D. decisus* (part) Buckton 225, pl. 1, f. 1.

A single example from Queensland, Bundaberg (IX-XII), which is probably this; the ocelli are however practically equidistant, a little more remote from one another if anything, while Goding says they are much nearer in *C. vitta*. This is also arboreal.

Buckton's *Ceraon* is perhaps identical with Stal's preoccupied genus *Daunus* and my *Zanophara*; his *Daunus* is a mixed assemblage, one species of which possibly belongs to *Ceraon*.

Sarantus Stal.

Sarantus Stal 1863 Tr, E. S. London (3) I, 592.

1. *nobilis*, sp. nov.

Pitchy, with yellowish pubescence; veins of tegmina apically and legs dark ferruginous; eyes yellowish. Tegmina vitreous with a slight yellowish tinge. Horns very sharp, bases remote, subperpendicular, directed slightly forward and outward, posterior process flat. Two subapicals elongate, the outer very little shorter than the inner.

Length: (female), 9 mill.
Hab: Queensland, Cairns (viii.)

Differs from *S. wallacei* Stal, by the legs not being pallidly annulate and the horns more perpendicular and shorter.

Terentius Stal.

Terentius Stal 1886 Hem. Afr. IV 87.

1. *convexus* Stal.

T. convexus Stal. 1869 O. V. A. F. p. 286.
Hab: Queensland, Kuranda (viii), Cairns (viii) arboreal
N. B.: Tarsi pale sordid flavous.

Dingkana Goding.

Dingkana Goding 1903 P. Linn. S. N. S. W. XXVIII, 8.

1. *borealis* Goding.

D. borealis Goding op. c. 9, pl. 1, f. 21 (tegmen).
Hab: *Queensland, Cairns (viii), Nelson (viii), Kuranda (viii)* arboreal.

The venation is variable, even in the tegmina of the same individual; the third subapical cell is sometimes divided, and there may be also two or more small supplementary cells.

Sextius Stal.

Sextius Stal 1866 Hem. Afr. IV, 88.

A genus of greenish forms, with the apical parts of the tegmina reticulate. The males are as a rule smaller, and the pronotal horns less developed. All the species are *Eucalyptus*-feeders.

The following species are all, I think, good, but difficult to define verbally. The following key may help to their identification:

1. No basal cross vein (sec. Goding).......*depressus* Goding.
1a. A basal cross vein..................................2.
2. Pronotum more or less swollen near the anterior margin ....*kurandae*, sp. nov.
(2a). Pronotum anteriorly practically flat medianly..........3.
(3). Posterior process extending beyond tegmina........ ....*longinotum* sp. nov.
(3a). Posterior process not extending as far as apex of tegmina. ....*bipunctata* (Fabr).
(4a). Tegmina immaculate. ....5.
(5). Horns feebly developed.................*bipunctata* vars.
(5a). Horns well developed..............................6.
(6). Horns and pronotum between them dark, pronotum anteriorly pale, tegmina sparsely marked with black.. ....*assimilis* sp. nov.
(6a). Horns and pronotum anteriorly dark, tegmina immaculate. .... *virescens* (Fairm.)

N. B. *Sextius virescens* Buckton 228, Pl. 31, f. 3, is impossible to determine, being probably a mixed species.

1. *depressus* Goding.

S. depressus Goding 12, Pl. 1, f. 24 (nymph).
Recorded from Queensland, West Australia, and several local-

ities in New South Wales. This species is distinguished by the absence of a cross vein near the base of the tegmen. I have not seen it.

2. *bipunctata* (Fabricius).

Membracis bipunctata Fabr. 1775 Syst. Ent. 677.
Sextius bipunctata Goding 12.

I think I have identified this correctly from a single specimen from Queensland, Cairns (viii); Fabricius' type was doubtless discolored. There are also specimens from Cairns (viii) and Kuranda (viii) apparently identical except that the black spots are absent. Also other specimens from Cairns (viii) and Bundaberg (11) which I place at present with this species, but which have the lateral horns turned a little forwards.

Length: (female) 7¼-7¾ mill; width across horns 2¼-3¼ mill. What are probably the males (Cairns viii), are only 5½ mill long, with less developed horns.

3. *virescens* (Fairmaire).

Centrotus virescens Fairmaire 1846 Ann. S. E. France IV. 515.
=*Ceresa suffusa* Walker 1851 List, 530.
=*Sextius virescens* Goding, Pl. 1, f. 2 (tegmen).

Some examples from New South Wales, Sydney (i-ii), apparently belong to var. *suffusa*.

Length: 6½ mill; width 3½-3¾ mill.

I do not think that *S. depressus* is distinct from this.

4. *assimilis* sp. nov.

Close to *S. virescens* but a little larger and broader, the horns are distinctly more elongate and less blunt and are less arched before the downward turn near their apex. The horns, and the pronotum between them, are dark, but while in *S. virescens* the same thing occurs, in that case the whole of the pronotum anteriorly is dark, while in *S. assimilis* it is only a band, the anterior part being pale. In *S. virescens* also the tegmina are immaculate, in *S. assimilis* the veins are more or less sparsely marked with black.

Length: (female) 7½ mill; width 4¼ mill

Hab: New South Wales, Sydney (i).

5. *longinotum* sp. nov.

Allied to *S. virescens*, but the posterior process extends slightly beyond the apex of the tegmina; in all other species it is not extended as far. The horns as in *S. virescens* but less blunt and not turned backwards so much. The reticulation of the tegmina extends partly into the subapical cells. The pronotum between the horns (including them) is dark, the rest anteriorly being pale.

Length: (female 6¼ mill width 3¼ mill.

Hab: Queensland, Nelson (viii).

6. *kurandae*, sp. nov.

Allied to the immaculate form of *S. bipunctata* but much slenderer, the horns a trifle less pronounced, the anterior margin of the pronotum (viewed in front) narrowly, somewhat deeply impressed, the pronotum immediately posterior to this medianly swollen a little (practically flat in the other species). The tegminal reticulation extends into the subapical cells.

Length: (female), 6½ mill width 2⅓ mill.

Hab: Queensland, Kuranda (viii.)

Acanthuchus Stal 1866 Hem. Afr. IV, 87; *Acanthucus* Goding 6 and 13.

1. *dromedarius* sp. nov.

Allied to *A. kershawi* God., but the horns are larger and the clavus not entirely opaque, etc. Dark ferruginous, with bright yellow pubescence. Eyes yellow. Tegmina subhyaline, yellowish apically; costal cell, base of radial cell and of clavus opaque ferruginous with yellowish pubescence, veins yellowish ferruginous with yellowish pubescence. Legs yellowish and ferruginous. Pronotal horns large, extending beyond lateral margin of body. Disk posterior to this is roundly obtusangulately elevated and again elevated roundly at about the middle of the tegmen (not touching the latter in the middle); posterior process does not nearly reach the apex of the tegmina. Two subapical cells, the exterior nearly circular, not nearly reaching exterior margin of tegmen: third apical elongate.

Length: 4¼-4½ mill; width 2⅔ mill.

Hab: Queensland, Cairns (viii.)

2. *obtusus*, sp. nov.

Allied to the preceding, but the posterior process distinctly angular, not so broad. Dark ferruginous, with pale yellowish-

grey pubescence; base of tegmen and the entire costal cell, veins, etc., more or less dark ferruginous. Horns rather larger at the bases more contiguous, posterior process not so elevated posteriorly. Externor subapical cell subhemispherical; base of third apical cell curved inwards on the outer side.

Length: (female) 4½ mill, width, 3 mill.

Hab: New South Wales, Sydney (i).

Centrotypus Stal.

Centrotypus Stal 1866, Hem. Afr., IV, 88; Goding 26.

I think this genus runs gradually into *Acanthuchus* and that *Sertorius* is a synonym also.

1. *hospes*, sp. nov.

Black with yellowish pubescence. Scutellar tufts prominent, pale yellow. Tegmina vitreous, veins dark, or pale, ferruginous. Legs more or less ferruginous, intermediate and posterior tibiae with apical half yellowish. Horns slight, acuminate turned directly outward, very slightly upward and backward, bases remote. Exterior subapical cell elongate, suboval.

Length: 8 mill, width, 4¾ mill.

Hab: New South Wales, Sydney (i).

The following Membracidae, not included in Goding's Monograph, have been recorded from Australia. Their identification is doubtful without access to the types.

1. *Philya parvula* Buckton 1901, Mon. 57, Pl. 8, fig. 4, is I think, my *Phrynomorphyes parvula*, a Tetigoniine, and has nothing to do with *Philya*.
2. *Oxyrhachis neglectus* Buckton 1903 Mon. 224, Pl. 49, fig. 5. South Australia. Probably not an *Oxyrhachis*.
3. *Daunus succisus* Buckton 226, Pl. L, fig. 3. South Australia. Not a *Daunus*.
4. *Ceraon tumescens* Buckton 229, Pl. 51, fig. 1. Tasmania.
5. *C. contortus* Buckton 229, Pl. 51, fig. 2. Tasmania (?).
6. *Pterosticta rubrilinea* Buckton 230, Pl. 51, fig. 4.
7. *P. spreta* l. c., fig. 5.
8. *P. rubridorsata* l. c., fig. 6.
9. *P. xantha* Buckton 231, fig. 7.
10. *P. interposita* l. c., Pl. 52, fig. 1.
11. *Ibiceps falcatus* Buckton 239, Pl. 54, fig. 6.

16. *Sphaerocentrus luteus* Buckton 244, Pl. 56, fig. 6. All seven from S. Australia. Probably not a *Sphaerocentrus*, possibly an *Acanthuchus*.

Family 3 Cercopidae.

I have not had sufficient material before me to make many researches on this comparatively small family, of which I now describe 8 new genera, and 9 new species. I think however that Stal's subfamilies are founded on characters of convenience, not of real scientific value, for example: *Aufiterna* has the anterior margin of the pronotum straight, but it seems to me to belong really nearer *Polychaetophyes*, *Ptyelus*, etc. Moreover in some genera the anterior margin of the pronotum is so slightly curved, as to be almost straight.

Cercopidae are apparently not of very extensive occurrence on the Australian Continent, their headquarters lying in Central and South America and in the Oriental Region and the Malayan portion of the Australian; they have members however in every Zoological Subregion except the Hawaiian.

As is the case with many other of the older Hemipterous genera, *Cercopis* Fabricius has been employed at different times for many diverse forms. Stal (1869, Svensk. Vet. Akad. Handl., 8 no. 1, p. 11), fixes *carnifex* Fabr. as the type; it had however already been fixed as "*spumaria* Linn." by Latreille. *C. carnifex* is an Australian species unknown to me, and I do not even know to what genus it now belongs. Stal, in the work above cited, alters his *Cercopis* of the "Hemiptera Africana" (1866) to "*Cosmoscarta*," but does not redefine *Cercopis* (Fabr.) Stal: later, he adds *ferruginea* (Walker) from an unknown locality.

C. '*spumaria* Linn.', moreover, is not definitely known. Horvath (1899 Revue d'Entom. XVII (for 1898) 275) examined the Linnean types and found the first specimen to be *Aphrophora alni* (Fallen), the second *Philaenus spumaria* Auct., and concludes that the former fits the Linnean diagnosis better, as that notes "habitat in Salice." This however is not stating the case quite accurately; Linne writes (1758 Systema Naturae Ed. X, 437.) "Habitat in Europae Plantis variis, frequens in Salice viminali, latitans intra spumam," but as *spumaria* of later Catalogues never is found on *Salix*, I think Horvath's view must be sustained; this is the view also of Germar, Dufour, Burmeister, Rambur, Amyot and Serville, etc.

The following synonymy will elucidate this:

Genus 1. *Cercopis* Fabricius 1775, Latreille, etc.
=*Aphrophora* Germar, 1818.
type *Cicada spumaria* Linn., Latr., =*Cicada alni* Fallen.

Genus 2. *Philaenus* Stal 1864.
=*Cercopis* Kirkaldy 1901.
type *Cicada leucophthalma*, Linn., =*spumaria graminis* DeGeer, =*spumaria* of most later authors.

It may be noted here that authors refer constantly to *Aphrophora salicis* DeGeer. There is no such species; DeGeer described a form as *Cicada spumaria salicis*, an inadmissible term, and the species should be known as *Cercopis rustica* Fabricius.

There are 3 conventional subfamilies as follows:

(1). Rhinaulacinae (=Cercopinae of some authors) with about 25 genera.

(2). Cercopinae (=Aphrophorinae of some authors) with about 36 genera, and

(3). Machaerotinae, with 2 genera.

(Of *Embolonia* Provancher 1889, I have not seen the description and it is not mentioned by Goding or Ball.) These subfamilies are separable as follows:

1. Anterior margin of pronotum straight.......*Rhinaulacinae*.
1a. Anterior margin of pronotum rounded or angulate......2.
2. Scutellum flat, triangular.....................*Cercopinae*.
2a. Scutellum strongly elevated, armed with a long apical spine. .... *Machaerotine*.

But as noted above, this is a classification of convenience.

Subfam. Rhinaulacinae.

Euryaulax, gen. nov.

General appearance of *Phymatostetha* Stal. Vertex declivous, flat, longitudinally sulcate exterior to the ocelli, the sulci being parallel and the space between being about equal to that between a sulcus and the nearest eye; the middle lobe is divided by a transverse sulcus into two parts, the anterior being about half the length of the posterior (*).

The vertex is also narrowly, transversely impressed close to the posterior margin. The entire anterior (dorsal) margin of the head is strongly, acutely, carinate. The frons is pitted at its base and is strongly swollen, transversely striate, somewhat deep-

* It is possible that this middle lobe of the vertex is really a dorsal part of the frons.

ly and widely longitudinally impressed for at least two-thirds of its length, the sides of the impression forming slight but noticeable keels. Pronotum with 2 submedian lachriform impression near the anterior margin; posterior lobe obsolescently sulcate longitudinally. Scutellum also medianly impressed. The characters of venation, etc., are much those of *Tomaspis* Am. Serv. Legs normal. Antennae reaching laterally to about the intero-lateral margins of the eyes.

E. callitettigoides, sp. nov.

Head, anterior half of pronotum, scutellum, shoulders and a transverse fascia on tegmina, underside, etc., sanguineous, posterior half of pronotum, eyes, tegmina (except as above), antennae, tarsi, anterior tibiae (except basally) and the apical parts of posterior tibiae, etc., black or blackish.

Length: (Female) 7½, (male) 8½ mill.

Hab: Queensland, Cairns (male, viii), Kuranda (female viii.)

The subapical red band on the tegmina is broader in the female than in the male.

Aufidellus, gen. nov.

Apparently close to *Aufidus* Stal, but the pronotum posteriorly is almost evenly rounded and the costal margin is not arched basally.

1. *australensis*, sp. nov.

Yellowish-brown with pale yellowish pubescence. A small spot at the antero-interior angle of the lateral lobes of the vertex, the posterior margin of the vertex, as far as and including the ocelli, the posterior margin of the pronotum narrowly, lateral margins of scutellum narrowly, a transverse band at nearly one-third of the length of the tegmina, the tegmina veins mostly (except the costa), antennal peduncle, lateral margins of abdomen more or less, wing veins mosly, etc., black. Basal third of tegmina subcoriaceous, punctured, yellowish brown, rest hyaline. Middle lobe of vertex a little wider anteriorly than posteriorly, wider than lateral lobe, not sulcate transversely. Frons widely and somewhat deeply channelled (male) somewhat shallowly (female). Posterior tibiae with one spine about the middle. Tegmina with 2 discoidals, 4 apical areas and a stigma.

Length: (Male) 6¼-6¾ mill; (female) 7 mill.

Hab: Queensland, Kuranda (viii), Cairns (viii.).

Aufiterna, gen. nov.

Allied to *Aufidus* but tegmina more coriaceous and venation different. Pronotum anteriorly with 2 naked callose spots. Posterior margin emarginate, while it is truncate in *Aufidus*. In the tegmina there are 3 discoidals (subapical), 4 apicals well-marked, while there are another 5 small cells marked off on the costal cell. There is a narrow appendix. This genus seems to me more allied to *Polychaetophyes* and other Cercopine genera than to most Rhinaulacine forms.

1. *ptyeloides*, sp. nov.

Brownish testaceous, with paler pubescence; ocelli red. Apical half of tegmina hyaline. Beneath testaceous, lateral margins of abdomen more or less sanguineous. On the costa about the middle of the wing and extending inwards a little is a dark-brown smudge.

Length: 5-5¼ mill.

Hab: Queensland, Kuranda (viii.)

Petyllis, gen. nov.

Allied to *Aufiterna* but vertex short, frons more tumid and more lightly channelled, laterally strongly striate transversely. Pronotum with 8 naked callous spots in a line near the anterior margin, lightly and narrowly sulcate medio-longitudinally. Tegmina coriaceous, 3 discoidal (subapical, and 4 apical)costa with many cells anteriorly), two of the apical veins forking near the apex.

1. *australensis*.

Brownish testaceous, with yellowish pubescence. Apical part of vertex and basal part of frons black, rest of vertex reddish; ocelli reddish. Pronotum tinged in places with reddish. Tegmina with 2 faint, somewhat broad whitish transverse bands. Wing nervures pallid.

Length: 7¾ mill.

Hab: New South Wales, Mittagong (i).

The following forms have been recorded from the Australian Continent, but are unknown to me.

Gen. *Tomaspis* Amyot & Serville 1843 Hemipteres 560.

1. *Triecphora maculata*, Walker 1851 List. Hom. 673, W. Australia.

2. *T. inconstans*, Walker l. c.

Gen. *Cosmoscarta* Stal 1869 K. Svensk Akad. Handl., 88 No. 1, p. 11.

1. *C. australis* Butler 1874 List. Ent., 251, Pl. VIII, fig. 12. (=*Cercopis urvellei*, Walker); also from New Guinea.

Gen. uncertain?

1. *Cercopis carnifex*, Fabricius 1775 Syst. Ent., 688.

2. *Cercopis mirabilis*, Blanchard (in error?).

Subfam. Cercopinae.

Eurycercopis, gen. nov.

Head flat or slightly concave, triangularly produced in front, apex rounded (lateral lobes acute apicallly, not reaching nearly as far as median lobe), a little longer than pronotum medianly. Eyes much longer than broad, a little oblique. Ocelli obsolete, their rudiments about as far from one another as from the eyes. Frons elongate, convex, first segment of rostrum longer than the second. Vertex and pronotum not carinate, or at least very obsolescently, frons not carinate nor sulcate (or not noticeably so.) Pronotum 5 (or 7) sided, anterior margin rounded, very short (and slightly diverging) posterior to the eyes; posterolateral margins roundly emarginate, posterior margin deeply, almost rectangularly emarginate. Scutellum longer than wide. Tegmina convex, costal margin rounded, apex angularly rounded, apex angularly rounded; corium without a membrane, clavus apically acuminate. Wings with supernumerary cell, anal vein forked near the base. Posterior tibiae bispinose.

1. *nigrofasciata*, sp. nov.

Brown or yellowish brown, closely and finely pubescent (yellowish.) Frons blackish brown. Pronotum, scutellum and tegmina with more or less regular small black spots. Basal third of corium more or less blackish (except at extreme base), and a blackish fascia a little apical of the middle exteriorly to commissure of clavus; another fascia nearer the apex, broken in the middle. Legs more or less blackish brown.

Length: 8¼ mill.

Hab: Queensland, Nelson (vii.)

This is evidently closely allied to *Liorhina* Stal, but the ocelli in the latter are functional, the tegmina more reflexed, the wing neuration a little different, pronotum less emarginate posteriorly, etc. Stal has drawn the anterior margin of the pronotum incorrectly—making it truncate, whereas it is arched.

Philagra, Stal.

Philagra, Stal 1862 Trans. E. S. London (3) I, 592; and 1866 Hem. Afr. IV, 68; Matsumura 1903 J. Sapporo Agr. coll., II, 21.
Chalepus Walker 1851 List. Hom., 731.
Distinguished from all the other Cercopidae by the acuminately produced head.
1. *parva* (Donovan).
Fulgora parva Don., 1805 Ins. New Holl., Hem. Pl. I, f. 2.
=*Chalepus teliferus* Walker 1851 List. Hom. 731.
=*Rhaphirhinus* (?) *parvus* Walker, id. cit., 805.
=*Chalepus pugionatus* Stal. 1854 O. V. A. F., XII, 251.
=*Philagra parvus* Stal. 1866 Berlin Ent. Zeit., X, 386.
Hab: Queensland, Kuranda (viii), Nelson (vii), Bundaberg (ix-x), and Brisbane (vi); on *Casuarina*; also recorded from New South Wales.

The males are a little smaller than the females (males, $8\frac{3}{4}$-$10\frac{3}{4}$; female, 11-12 mill. long). The two males from Kuranda have the cephalic prolongations a little more turned up, and may be specifically distinct. The colours and patterns are very fairly constant. The species, as noted in the introduction, is a froth-producer in the nymph stages.

Polychaetophyes, gen. nov.

Allied to *Hindola* Kirkaldy. Vertex almost vertical, very short, transverse. Ocelli much nearer to one another than to the eyes. Frons perpendicular (at apex) to the vertex, at base about one-third of the width of the vertex, broadening out a little towards the middle tumid, somewhat lightly roundly impressed near the base (as seen ventrally, (the actual basal part is on the dorsal part of the head.) Antennal peduncle short and small, antennal ridges somewhat deep. Clypeus reaching to apex of anterior coxae. Rostrum reaching beyond base of middle coxae. Pronotum roundly declivous, transversely striate, wider than head and eyes, posterior margin deeply roundly excavated in the middle. Scutellum much longer than wide, posteriorly acuminately pro-

duced. Tegmina subhyaline, strongly punctured especially on clavus, with scattered granules on the veins, apical margin of clavus *obliquely truncate* (or, if the claval appendix be not counted, *acute*, not acuminate), membrane (and clavus apically) with an appendix. Wings with the anal vein forked near the base. Legs very short, especially the posterior femora; posterior tibiae with one long, acuminate spine about the middle of outside edge and one tiny subbasal acute spine.

1. *serpulidia*, sp. nov. (Pl. XXXIII, figs. 12 and 13. Pl.

XXVII, fig. 9. Pl. XXX, fig. 9.

Pale yellowish brown suffused with reddish. Pronotum yellowish with greenish and reddish tinges. Scutellum reddish, obscurely pallid in the middle and posteriorly. Anterior and interior legs more or less dark, posterior legs more or less pale. Tegmina subhyaline, colorless; basal third of corium and clavus and apex of clavus dark brownish (more or less ruddy), apical fourth yellowish brown. Granulations dark brown. Pronotum very lightly carinate longitudinally; much wider than head and eyes. Scutellum shallowly channelled along its anterior three-fourths, posterior fourth carinate.

Length: 6¾-8 mill.

Hab: Queensland, Bundaberg (xi.)

There is also a female (8 mill.) from the same locality and time of capture, which differs only by having an almost continuous fascia across the tegmen instead of the short wedge at the apex of the clavus. A bred specimen (2306 K) is immature, but there is little doubt that it is referable to this species. The nymph-cases are whitish, often tinged with purplish-red. (Pl. XXIII, f. 12 and 13). (No. 2306 consists of seven on a single twig). They are elongate-subconical, more or less porrect, or with a slight curve, widening gradually from the base.

Length when full grown 11-16 mill., width at mouth 3-3½ mill.

See the introduction for remarks on these cases.

2. *aequalior*, sp. nov.

Similar to *P. serpulidia* but pronotum smaller and very little wider than head and eyes; pronotum punctured (not striate). Tegmina punctured but veins not granulate. Dorsal part of frons more swollen, wider anteriorly.

Yellowish brown, frons with black, transverse subparallel lines. Legs, etc., more or less black. Clavus and corium basal-

ly coriaceous, apically more membranaceous, medianly colorless (except veins).

Length: 7 mill.

Hab: Queensland, Bundaberg (xi.)

Pectinariophyes, gen. nov.

Closely allied to *Polychaetophyes*, but with the posterior margin of the head raised, pronotum much less declivous, also much longer in proportion to the head. Ocelli farther apart, frons more swollen.

1. *pectinaria*, sp. nov. (Pl. XXVII, fig. 8.)

Yellowish, vertex tinged with red. Eyes dark. Frons transversely lined narrowly with blackish. Posteriorly legs more or less dark. Pronotum but little wider than head and eyes, punctured, scarcely striate. Scutellum flat, not carinate or channelled. Tegmina punctured, not granulate.

Length: 5 mill.

Hab: Queensland, Bundaberg (xi, bred, Koebele's No. 2307).

One specimen, unfortunately rather immature. It has been described only to connect with the pretty nymph cases which smaller and slenderer than those of *Polychaetophyes*, smoother in texture, and of much finer workmanship. They are pale-yellowish brown and are fastened to twigs by twos and threes.

Length: 13 mill.; width of mouth, about 2 mill.

Anyllis, gen. nov.

Distinguished by the interior vein of the wings being furcate posterior to the middle, and by the anterior margin of the pronotum being obtusangulately produced a little.

Vertex transverse, slightly concave, longitudinomedianly carinate, subangulately rounded anteriorly. Ocelli a little nearer to the base than to the apex, about three times as far from the eyes as from one another. Frons and clypeus strongly carinate, the former narrow and little swollen, the carina strongly raised. Rostrum reaching to about posterior coxae. Posterior tibiae with one strong spine. Pronotum longitudinally carinate, about twice as long as vertex, scarcely wider than head and eyes, elevated posteriorly, posterior margin somewhat

deeply emarginate. Tegmina subcoriaceous, 3 discoidals, costally with many veins, apical vein forked and reforked.

1. *leiala*, sp. nov.

Cinereous; with pale yellow pubescence; vertex and pronotum anteriorly with whitish markings, ocelli pale reddish. Tegmina mottled more or less with whitish, rather faintly. Head, pronotum, tegmina, etc., punctured.

Length: $6\frac{1}{2}$-$6\frac{3}{4}$ mill.

Hab: Queensland, Kuranda (viii P).

Bathyllus Stal.

Bathyllus Stal. 1866 Hem. Afric., 68.

1. *albigutta* (Walker).

Lepyronia albigutta Walker 1858, List. Hom. Suppl., 191.

L. moerens Stal. 1854 O. V. A. F., XI, 251.

I somewhat doubtfully refer two individuals in my own collection, to this genus and species, but Stal, says that the anterior angle is acute, in these it is distinctly rounded.

The following Cercopinae have been recorded from Australia but are unknown to me:

Gen. *Hindola* Kirkaldy, 1900, Entom. XXXIII, p. 243.

1. *Aphrophora compacta* Walker, 1851, List. Hom., 701 (=*A. semiflava* Walker, 1858, Suppl. 187.)

2. *Lepyronia* (?) *australiae* Walker 1851, List. 727 (=*Aphrophora admittens* Walker 1858, Suppl. 345=*A.* (?) *areolata* Walker l. c.)

3. *Carystus reticulatus* Spangberg 1878, O. V. A. F., XXXIV No. 9, p. 12.

4. *C. stali* Spangb., l. c.

5. *C. sorurculus* Spangb., l. c.

6. *C. mutabilis* Sprangb., op. c., 13.

Gen. *Uncertain*?

1. *Aphrophora albicincta* Erichson, 1842, Archiv. Ent., I, 285.

2. *A. bifrons* Walker 1851 List. 702.

3. *Lepyronia convexa* Walker 1851 op. c., 726.

Subfam. 3. Machaerotinae.

The following form, unknown to me, has been described from Australia.

Gen. *Macherota* Burmeister 1835, Handb. Ent. II, 127 and 128.

1. *M. pugionata* Stal. 1865, O. V. A. F., XXII, 154.

Fam. Fulgoridae.

Subfamily Fulgorinae.

Distinguished by the reticulation of the anal area of the wings; the clypeus is carinate laterally. A large number of the forms are brightly colored, while the same or others are remarkable for the extraordinary shape of the head. In the Australian genera at least, the radial, median and brachial veins issue separately from the apical margin of the basal cell. These forms are apparently poorly represented in Australia, only 3 genera and 11 species being known; of these 1 genus and 3 species are now added.

1. Head produced in front, longer than the nota..........2.

1a. Head very little prominent before eyes, shorter than the nota together......................3 *Desudaba* Walker.

2. Costal margin arched; vertex wider than eye, prolongation strongly narrowed anteriorly...........1 *Eurystheus* Stal.

2a. Costal margins subparallel in repose; vertex not wider than an eye, prolongation not narrowed anteriorly.......... ....2 *Eurinopysche*, gen. nov.

Eurystheus Stal.

Eurystheus Stal, 1862 Berlin. Ent. Zeit VI, 303.

Although described in 1862, this genus was not included by Stal in 1866 in his table of genera in the "*Hemiptera Africana*."

1. *dilatata* (Westwood).

Fulgora dilatata Westwood 1842 Trans. Linn. Soc. London XVIII, 146, Pl. XII, figs. 8 and 9.

Length: 15½ mill.

Hab: Western Australia, Swan River.

This species and *Eurinopysche obscurata* were included by Walker in his new genus *Prolepta*, but are not congeneric with his type *P. apicalis* from the Philippines.

2. *perkinsi* sp. nov.

Close to *E. dilatata*, but cannot be that species, as it is much larger, the vertex longer and not tapering during the apical two-thirds, about as long as the thorax and abdomen together. The specks on the tegmina are smaller and not ocelliform, are at least twice as numerous, the apical part of the tegmina being well sprinkled. The coloring is that of *E. dilatata*, but the tegminal markings are, as a whole, paler. In profile the serrations of the head are flatter and shallower.

Length: 27 mill.

Hab: Queensland, Bundaberg (xi), bred; arboreal.

Eurinopsyche, gen. nov.

The type of this was one of the original species of *Eurystheus*, but can scarcely be included therein. It differs more particularly by the different form of the head, the vertex at base being narrower than an eye. Tegmina decumbent (in *Eurystheus* they are subtectiform), costa scarcely arched. Pronotum with sublateral subtransverse arched keels.

1. *obscurata* (Fabr.)

Fulgora obscurata Fabricius 1781 Spec. Ins. II, 315; Westwood 145, Pl. 12, f. 7.

Length: 20½-21 mill.

Hab: Queensland, Bundaberg (xi), Brisbane (vi), arboreal.

There is a nymph of an allied form, in which the cephalic prolongation is sensibly widened anteriorly. This nymph, like all those of this sub-family, is liberally endowed with sensory organs. The vertex has them literally everywhere it is possible to crowd them; on the ventral part of the prolongation there are none and only a few on the frons proper; none on the clypeus. They are sparser, but still numerous, all over the nota, tergites and even on the tegminal pads.

Length: 11 mill, width 4½ mill.

Hab: Brisbane (xi).

From Sydney (i), there are two specimens, in which the head is much longer than in any of the other forms and is spatulate anteriorly. The spatulate part is crowded with sensory organs, but there are comparatively few others on the head. Those on the nota and abdomen much as in the Brisbane forms.

Length: 8½ mill, width 2 mill. Pl. XXIX, fig. 11.

These nymphs appear to belong to undescribed species (and possibly genera).

Koebele's No. for this is the same as for *Thanatodictya hebe*, but this nymph scarcely belongs to a Dictyophorine, it probably only means that the same parasite attacks both.

Desudaba Walker.

Desudaba Walker 1858 Suppl., p. 58.

Metanira Stal. 1863 Stettiner Ent. Zeit. XXIV, p. 236.

There are 6 species of this genus, Australian and Papuan, which may be separated as follows:

1. Wings basally with a reddish or yellow spot............2.
1a. Wings basally with a bluish or greenish spot............5.
2. Head, pronotum and scutellum blackish................3.
2a. Head, etc., more or less olivaceous..3 *danae* (Gerstaecker).
3. Frontal process reaching to base of vertex....6 *circe* (Stal.)
3a. Frontal process reaching to about middle of vertex......4.
4. No red spots on tegmina.............1 *psittacus* (Walker).
4a. Red spots on tegmina.................2 *maculata* Distant.
5. Abdomen black, marked with green basally; ground color of tegmina basally red-brown, spotted with yellow (Papua) ....4 *scylla* Distant.
5a. Abdomen black, with 3 greenish fasciae (sometimes broken into 4 spots), sternites apically greenish; basal ground color of tegmina dark crimson, no yellow spots.....5 *aulica* Stal.

1. *psittacus* Walker.

D. psittacus Walker, 1858, Suppl., 59.

Metanira thisbe Stal. 1863, Stettiner Ent. Zeit. XXIV, 236.

Length: 16 mill.

Hab: Queensland, Brisbane (my coll); recorded from Moreton Bay (Walker and Stal.)

2. *maculata* Distant.

D. maculata Distant 1892 T. E. S. London, 277.

Hab: Queensland, Peak Downs.

3. *danae* (Gerst).

Metanira danae Gerstaecker 1895 Mt. Nat. Ver. Neu-Vorpommern XXVII, 24.

Hab: Queensland (Gerst); Bundaberg (11 P), on wild and cultivated *Citrus*.

5. *aulica* Stal.

D. aulica Stal. 1869 Berlin. Ent. Zeit. XIII, 241.

Hab: Queensland; Cairns; also Rockhampton (Stal), arboreal.

6. *circe* (Stal.)

Metanira circe Stal. 1863 Stettiner Ent. Zeit. XXIV, 237.

Hab: Lizard Island.

N. B.—There are two Lizard Islands, one off Queensland, the other near Lefu. This might well be either.

Subfamily Dictyophorinae.

Antennae very much as in Fulgorinae. Rostrum with last segment sufficiently long. Radial and cubital veins with a common, short stem; anal vein running into commissure; no transverse veins in the costal cell. Anal area of wings not reticulate.

1. Clavus with a transverse vein...............1 *Cajeta* Stal.
1a. Clavus without transverse vein........................2.
2. Tegmen with a veined costal cell; posterior margin of pronotum truncate.......................4 *Astorga*, gen. nov.
2a. Tegmen without costal cell; posterior margin of pronotum angularly marginate.................................2.
3. Color testaceous marked with blackish brown. Lateral margins of pronotum distinctly rounded...............
...............................2 *Thanatodictya* gen. nov.
3a. Color greenish; lateral margins of pronotum straight or slightly concave......................3 *Hasta* gen. nov.

Cajeta Stal.

Cajeta Stal 1886 Hem. Afr. IV, 150.

1. *singularis* Stal.

C. singularis Stal. 1866 Berlin Ent. Zeit., X, 391.

Hab: "North Australia." (Probably Queensland).

Thanatodictya, gen. nov.

Allied to *Dictyophora* Germar. Head very elongate, narrow: lateral margins of vertex subparallel, slightly broadened and obtuse-angulate at the apex; as seen in profile the head is straight and correct, eyes touching pronotum. Vertex bordered on each side by a keel, and there is a median keel which is usually subobsolete except about the basal fifth and the extreme apex. Frons 5-carinate, including the lateral margins. Clypeus tricarinate. Second antennal segment small, globular.

Tegmina hyaline, apical third subreticulate. Legs simple, posterior tibiae 4-spined.

1. Tegmina with a broad, entire, longitudinal, dark stripe; vertex basally only slightly nodulose (subgen. *Lucinda* nov.... .... 2 *lucindae* sp. nov.

1a. Tegmina colorless, except the dark apical third, or less...2.

2. Vertex not nodulose basally; head porrect; Stigma pallid, composed of 5 or 6 cells; length over 14 mill.............. .... 1 *praeferrata* (Distant).

2a. Vertex strongly nodulose at base (stigma darker) (subgenus *Niculda* nov., type *anadyomene*)..................3.

3. Stigma with 3 or 4 inconspicuous transverse veins; head somewhat ascending; length under 10 mill............... .... 3 *anadyomene*, sp. nov.

3a. Stigma composed of 2 cells; head porrect................4.

4. Darker; length 11 mill...................4 *hebe* sp. nov.

4a. Paler; length 9 mill.....................5 *psyche* sp. nov.

Subgenus *Thanatodictya* nov.

1. *praeferrata* (Distant).

Dictyophora praeferrata Distant 1892 Trans. Ent. Soc. London, 279.

Length: 12-15 mill.

Hab: Queensland, Bundaberg (ix-xii), reported from Peak Downs by Distant.

Subgenus *Lucinda* nov.

2. *lucindae* sp. nov.

Testaceous, keels of head in front of eyes black; lateral margins of pronotum and scutellum (exterior to keels) and abdo-

men mostly, blackish brown. Tegmina hyaline, veins pallid, a longitudinal blackish brown entire stripe broadening apically. Legs brownish testaceous, narrowly striped with blackish brown.

Length: 10-12 mill.

Hab: Queensland, Lucinda Point (vii) on rushes.

Subgenus *Niculda* nov.

3. *anadyomene* sp. nov.

Blackish or blackish brown; head testaceous or stramineous, except the apex, keels in front of the eyes and frontal area between submedian keels; base of vertex and disk of pronotum pale brownish testaceous, a longitudinal ivory white stripe on emesonotum extending to posterior angle. Under side pale, sordid, testaceous, marked with black. Tegmina and wings hyaline, colorless, veins pale brownish, apically many of them whitish; 2 black smudges, one from apex of suture to apex of tegmen broadly, the other on the stigma, etc. Head slightly ascending, about as long as the nota and abdomen together.

Length: 6½ mill to apex of abdomen; 7½-9½ mill to apex of tegmina.

Hab: Bundaberg (ix-xii), Brisbane (xi), arboreal.

4. *hebe*. sp. nov. (Pl. XXIX, fig. 10).

More or less sordid ferrugineous. Keels on head black in front of eyes. Pronotum with a longitudinal ivory white line broadening out on the scutellum, the posterior angle being entirely ivory white. Lateral margins of the ventral part of the pronotum, lateral margins of mesopleura, etc., ivory white. Lateral margins of the ventral part of the pronotum, lateral margins of mesopleura, etc., ivory white. Tegmina colorless, hyaline; veins, stigma and a smudge from apex of claval suture obliquely to apex of tegmen, blackish or brownish black. Abdomen marked with black.

Length: 11 mill.

Hab: New South Wales, Sydney (ii).

5. *psyche* sp. nov.

Allied to the preceding but smaller and paler. Head nearly as long as the rest of the body. Pale greenish grey, disk of ver-

Tegmina pale brownish yellow, a brownish smudge on costal membrane and costal cell, also on apical margin (except extreme apex) with subparallel darker stripes, and two longer ones near apex across tegmen, also one or two small irregular specks on disk of corium and clavus. Wings pale smoky, veins pale brown. Legs lined with brownish.

Length: $7\frac{1}{2}$-$8\frac{3}{4}$ mill.

Hab: Queensland, Cairns (vii-viii) on sugar cane and grasses

Subfamily 3. Cixiinae.

Apical part of tegmen not reticulate, much fewer cells than in Dictyophorinae. Radial and median veins approximate at base, remote from cubital. No subcostal cell. (Usually three ocelli.) Anal vein running into commissure.

It is difficult to differentiate this subfamily from the Dictyophorinae by words, but they can hardly be confused. As a rule the latter are much more elongate and the apical parts of the tegmen reticulate or with many apical cells.

1\. Antennae minute.................................2

1a. Antennae elongate, distinctly visible beyond the lateral margins of the head.............1. *Solonaima* gen. nov.

2\. Scutellum with 5 keels, 3 ocelli present....2 *Oliarus* Stal.

2a. Scutellum with 3 keels, 2 ocelli only.................3

3\. Head produced well in front of eyes, vertex elongate....4

3a. Head little or not produced in front of eyes, vertex transverse.....................5. *Calamister* gen. nov

4\. Tegmina of the usual *Cixius* form..3. *Carolus* gen. nov.

4a. Tegmina in repose (as seen dorsally) very strongly narrowed apically..............4. *Gelastocephalus* gen. nov.

(*Lamenia* Stal is not included in this table.)

1\. *Solonaima*, gen. nov.

Apparently allied to *Brixia* Stal, but the antennae are longer and more cylindric; frons lightly carinate, etc.

Head and eyes much narrower than pronotum; lateral margins of the deeply concave vertex convergent postero-anteriorly, anterior margin truncate, posterior margin deeply emarginate. Frons with an apical ocellus; roundly curved as seen in profile, the disk deeply concave, very narrowly almost to apical margin (ventral) eyes, then widening a little, medianly slightly carinate.

Part of the frons is visible dorsally owing to short vertex. Clypeus elongate, carinate laterally. Eyes deeply excavated beneath. First segment of antennae cylindric, reaching nearly or quite to lateral margin of frons; second longer than first, cylindric, reaching well beyond base of clypeus. Posterior legs elongate, tibiate spineless.

1. *solonaima*, sp. nov.

More or less pale fulvotestaceous; eyes and first segment of antennae black, as also tergites more or less. Sternites more or less sordid. Tegminal veins pale and darker brown, not granulate nor piliferous.

Length: (male), 6-6¼ mill.

Hab: Queensland, Cairns (viii.)

Oliarus Stal.

Oliarus Stal. 1862 Berlin Ent. Zeit. VI, 306; Kirkaldy 1902 Faun. Haw. III, 119.

An almost cosmopolitan genus, very rich in species. None have up to the present been described from Australia, but 9 are now brought forward here.

In all the Australian forms known, the cubital is forked nearer the base than is the radial.

1. Axillary vein of clavus running into anal vein, basal of the middle of the latter.............................2.
1a. Axillary running into anal at, or apical of, the middle of the latter.......................................5.
2. Axillary very short, not quite half (taken always from its curving or angulation at the commissure) the length of the stalk of the anal...............1. *laertes* sp, nov.
2a. Axillary long, more than half the length of the stalk of the anal.......................................3.
3. Tegminal veins more or less thickly granulate........4.
3a. Tegminal veins not (or obsolescently granulate)...... ....2. *kampaspe*, sp. nov.
4. Head and scutellum pale, veins pallied, granulate with brownish-black.....................3. *talunia*, sp. nov.
4a. Head and scutellum black and castaneous, veins dark.. ....4. *asaica*, sp. nov.
5. Vertex short and broad, the forking taking place near the apex............................5. *felis*, sp. nov.

5a. Vertex longer, forking about the middle..............6.
6. Species less than 5 mill. long; vertex long and narrow, much narrower at base than at eye..6. *alexanor*, sp. nov.
6a. Species more than 6 mill. long; vertex wider, scarcely or not narrower at base than an eye....................7.
7. $8\frac{1}{2}$ mill long; veins not granulate.......9. *lubra*, sp. nov.
7a. $6\frac{1}{2}$ mill long.......................................8.
8. Tegminal veins granulate............7. *sponsa*, sp. nov.
8a. Tegminal veins not granulate........8. *phelia*, sp. nov.

1. *laertes*, sp. nov.

Blackish, keels more or less ferruginous. Pronotum otherwise entirely black. Veins brownish, base of apical cells narrowly infuscate, stigma dark. Tibiae and tarsi more or less ferruginous.

Vertex elongate, twice as long as broad, much narrower than an eye. Rostrum reaching to posterior coxae. Tegmina granulated, very lightly piliferous. Auxillary vein running into anal, scarcely apical of the posterior angle of the scutellum; that is at about one-fourth of its length, consequently the axillary is much shorter than the basal part of the anal and is in the same straight line as the apical part of the anal, the basal part of the anal being much curved. Posterior tibiae with a median spine and one near the base, also two tiny basal spines.

Length: $5\frac{1}{2}$ mill.

Hab: New South Wales, Mittagong (i).

2. *kampaspe*, sp. nov.

Close to *O. alexanor* but larger and not granulated, claval venation different. Tegminal veins dark and pale brownish, bases of apical cells infuscate.

Length: $5\frac{1}{3}$ mill.

Hab: Queensland, Kuranda (viii).

3. *talunia*, sp. nov.

Pale testaceous, lateral margins of scutellum and the space between sublateral and median keels, browner. Apices of apical veins and the bases of apical cells rather widely infuscate. Ver-

tex long and narrow, acutangularly apically. Veins strongly granulate, scantily piliferous.

Length: 5 mill.

Hab: Queensland, Cairns (viii).

4. *asaica*, sp. nov.

Head, scutellum within lateral keels and some marks on pronotum, blackish ferruginous; keels on head, etc., ochraceous. Apical half of frons ferruginous, also keels on scutellum. Scutellum outside lateral keels, apical segment of rostrum, sternites etc., ferruginous; femora sordid ferruginous, tibiae paler. Tegmina hyaline, veins dark brown and pale brown; stigma brown; bases of apical cells thickened, darked. Similar in proportions to *O. lubra*, but much smaller; the lateral margins of the vertex fork nearer to the apical margin than to the middle and there is a tiny transverse keel uniting the two oblique keels just posterior to the apical margins; the frontal fork is very close to the posterior margin of the frons. Vertex much narrower than in *O. lubra*, and the lateral margins posteriorly less divergent. Rostrum reaching beyond middle of posterior coxae. Posterior femora with a strong median spine and two small ones nearer base (basal one obsolescent). Tegmina more granulate, slightly piliferous.

Length: 7 mill.

Hab: New South Wales, Sydney (i).

5. *felis*, sp. nov.

Blackish, keels of head and pronotum more or less pallid. Keels of scutellum obscurely blackish ferruginous. Vertex broad. Vertex at base a little wider than median length, wider than an eye. Tegmina lightly granulate and lightly piilferous. Axillary vein joining anal about midway between posterior angle of scutellum and apex of clavus, shorter than basal part of anal. Tibiae with a basal and a median spine.

Length: 4 mill.

Hab: Queensland, Cairns (viii).

6. *alexanor*, sp. nov.

Blackish, keels more or less yellow on head and pronotum, more or less ferruginous on scutellum. Basal two-thirds of

tegminal veins pale, darkly granulated, apical third darker, bases of apical cells infuscate. Legs pallid.

Tegmina minutely but closely granulated, not piliferous. Posterior tibiae with one spine a little basal of the middle, and an obsolescent basal one.

Length: 5 mill.

Hab: Queensland, Cairns (viii).

7. *sponsa*, sp. nov.

Ferrugineotestaceous, more or less pale. Veins of tegmina and stigma sordid stramineous; stigma internally, apical veins etc., brownish, the bases of apical cells a little thickened. Head, granulations, etc., as in *O. lubra*, except that the forking is a trifle nearer to the middle. Costa arched slightly, very obtuse angularly close to base.

Length: (male), 6¾ mill.

Hab: Queensland, Cairns (viii).

8. *phelia*, sp. nov.

Pale yellowish ferruginous, pronotum pallid, scutellum more or less blackish, tegmina as in *O. asaica*, except that the apical veins are more infuscate apically. Tergites more or less marked with blackish. Head as in *O. asaica*, except that the vertical forking occurs about the middle. Rostrum reaching to about intermediate coxae. Tegmina not (or scarcely) granulate, not piliferous. Posterior tibiae with two small spines on basal half (basal one obsolescent.)

Length: 6¼-6½ mill.

Hab: Queensland, Kuranda (viii), Nelson (vii).

Var: Blackish ferruginous; keels of vertex and frons pale ferruginous. Pronotum pallid, two streaks on scutellum ferruginous.

9. *lubra*, sp. nov.

Head and legs ochraceous; the apex of the vertex, the three cells between vertex and frons, clypeus, sterna (mostly), the scutellum between the median and submedian keels and outside the lateral keels etc., blackish. Pronotum yellowish, more or less fuscate. Scutellum between submedian and lateral keels, and the keels themselves, ferruginous. Sternites mostly yellowish. Teg-

mina hyaline, veins and stigma yellowish-brown and brown; stigma internally brownish. The bases of the apical cells a little infuscate. Veins of tegmina feebly and very minutely granulate; not piliferous.

Vertex about as wide as an eye, appears longer than wide, though the basal width is actually greater than the median length, with the base deeply acutangularly emarginate, medianly carinate slightly, and a sublateral carina on each side starting from lateral margin at about one-third of its length and proceeding towards middle of anterior but turning off just before it reaches there, meeting the anterior margin at right angles. Frons forked about middle of anterior lobes. Rostrum reaching to about midway between intermediate and posterior coxae. Submedian keels of scutellum very slightly rounded externally. Costa straight, not or scarcely arched. Axillary vein running into anal at about its middle, and shorter than the basal part of the anal. Posterior femora with two small spines on basal half.

Length: (male), 8½; female), 8½-9¼ mill; width, 2⅓ mill.

Hab: Queensland, Bundaberg (ix-xii), Brisbane (xi).

Carolus, gen. nov.

Like *Cixius* in appearance, with longer head.

Vertex triangular, extending well in front of eyes, a little rounded at tip, longer than wide, disk much hollowed out, carinate medianly, lateral margins acute, subvertical. Frons and clypeus sublanceolate, the former subnodulose near the base, carinate medianly; clypeus carinate medianly and laterally; no frontal ocellus. Pronotum truncate apically in the middle, posteriorly deeply rectangularly emarginate. Scutellum strongly tricarinate. Radial and cubital veins forked about the same place, i. e., a little nearer the base than the middle of the tegmen. Tibiae not spinose.

1. *crispus*, sp. nov.

Head, pronotum and underside more or less pale sordid ferruginous (sterna and sternites partly darker.) Scutellum ferruginous, laterally darker. Tegmina hyaline, veins yellowish-testaceous, thickly granulated with blackish, strongly but shortly piliferous.

Length: (male), 6¾ mill.

Hab: New South Wales, Sydney (i.)

Gelastocephalus, gen. nov.

Allied to *Carolus*, but the tegmina in repose as seen dorsally, are almost linear posteriorly.

Head and eyes narrower than pronotum. Vertex elongate, somewhat ascendant, the disk depressed, the lateral keels acute, converging anteriorly straightly, strongly prominent in front, nearly twice as long as wide, anterior angle acute, slightly rounded; posterior margin roundly emarginate. Eyes longer than broad, extending laterally as far as anterior margin of pronotum.

Frons and clypeus medianly fused, spindle-haped, the former strongly carinate laterally, the keels suddenly curving around to the thorax a little apical of the middle of the fused segments. Ocelli small but distinct, the frontal one absent. Clypeus angulate; not carinate laterally. Antennae small, not inserted near clypeus.

Pronotum almost linear, anterior margin very highly angularly arched, lateral margins short, diverging; posterior margin deeply, acutangularly emarginate. Scutellum diamond-shaped tricarinate.

In repose the tegmina (as seen dorsally) are arched laterally posterior to the shoulders, apical half very strongly narrowed. Legs short, anterior femora slightly longer than tibiae, posterior tibiae spineless, first segment of tarsi longer than 2nd and 3rd together.

1. *ornithoides*, sp. nov. (Pl. XXXII, figs. 6-7).

Head and pronotum pale ferruginous; scutellum, apex of clypeus, sterna (mostly), abdomen etc., black. Clavus pale fulvous, rest of tegmina cinerous; apical third, a blotch about the middle and most of the costal margin between these dark brownish. Corium strongly and closely granulate with dark brown, not (or very shortly and scantily) pilose. Femora and tibiae dark brown, tarsi pallid.

Length: male, 5 mill.

Hab: New South Wales, Sydney (i).

Calamister, gen. nov.

Vertex transverse, disk depressed, not carinate medianly, apically rounded, very slightly produced before the eyes. Frons widening out apically, medianly carinate, no frontal ocellus. Cly-

peus rather obsoletely carinate laterally. Scutellum tricarinate. Venation as in *Carolus*. Tibiae not spinose.

1. *obscurus*, sp. nov.

Testaceous, vertex a little darker. Tegminal veins pale brownish, lightly granulate, slightly piliferous.

Length: 5 mill.

Hab: Queensland, Bundaberg (ix-xii.)

Lamenia, Stal.

Lamenia Stal 1859 Eugenies Resa Zool. 277 Pl. IV, fig. 5; Ashmead 1889 Ent. Amer., V, 4; Melichar 1905 Wein. Ent. Zeit. XXIV, 285.

Herpis Stal 1860 K. Svensk. Vet. Akad. Handl., XIII, No. 6, p. 8.

Stal placed this among his Derbida, while Ashmead locates it in his subfamily Flatinae between *Siphanta* and *Amphiscepa*. It appears to me to be a *Cixiinc*; it cannot be placed among the Derbidae because the anal vein of the tegmina runs into the commissure and it cannot be a "Flatid," first on account of the venation, and secondly because there is no trace of intervenal (or any) granulation. It might be located in the Achilidae were it not for the course of the anal vein.

It has a very wide distribution; i. e., well over the American continents, Polynesia, Africa, etc.

1. *kulia*, sp. nov. (Pl. XXI, fig. 4.)

Differs from *L. vulgaris* (Fitch),* by the frons being much more declivous and the lateral margins distinctly, sinuately, widened apically (in *fitchi* they are nearly parallel.) It differs from *L. caliginea, orba, pallidovenosa, fimbricola*, etc., by the colour and from *lugubrina* by the form of the frons.

Vertex and pronotum sordid brownish, frons and clypeus sordid ferruginous. Scutellum polished black. Tegmina subhyaline, dark smoky, with a blue tinge. Legs pale. Abdomen more or less blackish.

Vertex very short, transverse, anteriorly roundly truncate; frons with lateral margins sinuate, apically widened.

* The only species I have seen, kindly lent me for examination by my colleague, Mr. Swezey.

1. *saccharida* Kirkaldy. (Pl. XXVI; Pl. XXVII, figs. 1-5).

Perkinsiella saccharicida Kirkaldy 1903 Entom. XXXVI, 179; Perkins 1903 Bull. I, Comm. Agr. Hawaii; Van Dine 1904 Bull. Hawaii U. S. Agr. Exp. Sta. 5.

Testaceous, lateral margins of pronotum and scutellum dark brown, basal half of frons and most of the clypeus light brown, the former with 2 or 3 short narrow interrupted transverse pale lines near the base. A large black spot on anterior coxae, intermediate coxae and mesopleura each; abdomen black variegated with testaceous. Apex of first segment of antennae black, second segment brownish. Tegmina hyaline, commissure whitish. Anterior and intermediate tibiae annulate with blackish.

Male always macropterous; the 5th and 6th (and sometimes the 4th) apical cells dark smoky, the stripe being sometimes continued very narrowly to the base of the tegmen. Genital segments mostly black.

Female dimorphic (with intermediate forms); longwinged form with the tegminal stripe usually broader on the corium; short winged form much stouter, with hyaline tegmina, a short narrow black line close to apex of clavus. Genital segments pale.

Length: 5-5$\frac{3}{8}$ mill (macropterous); 4 mill (brachypterous).

Hab: Wherever sugar cane is grown in Queensland, New South Wales, and Hawaiian Islands. (Koebele No. 2230). (See also the Introduction). Also on grasses and sedges.

2. *graminicida* sp. nov.

Closely allied to the preceding, but a little smaller. The tegminal veins are more thickly granulate especially in the female. Antennae a little shorter and less stout. Pronotum and scutellum scarcely darkened laterally.

Male always macropterous; exterior half of 5th and 6th apical cells smoky, also apices of apical veins, etc.

Female always brachypterous.

Length: (Male) 5 mill; (female) 4 mill.

Hab: Queensland, Cairns (vii-viii, Koebele's No. 2249), on grasses.

3. *vitiensis*, sp. nov.

Closely allied to the typical species, but pronotum and scutellum not darkened laterally.

Male macropterous; third to 6th apical cells smoky (except a small hyaline spot on each, near apex), also around 2nd and 3rd apical veins.

Female macropterous; tegmina immaculate except that the apical parts of 4th to 6th apical cells are more or less smoky.

Length: $4\frac{3}{4}$ (male), $5\frac{7}{8}$-8 mill (female).

Hab: Viti, Levuka, on sugar cane (III, Koebele's No. 2346).*

4. *vastatrix* (Breddin.)

Dicranotropis vastatrix Breddin 1896 Deutsch. Ent. Zeit. 107; Zehntner 1897 Arch. Java Suiker V., p. ? (Sep. p. 25); Krueger 1899 Das Zuckerrohr und seine Kultur p. 312, Pl. XIV, f. 1. c.; Busse 1904 Arb. Biol. Abt. Land. Kais. Ges. Amt., IV, 319-422. Plates I-II, etc.

Hab: Java, on Sugar Cane. (Breddin and my collection); also reported from German East Africa on *Andropogon sorghum* by Melichar (1905).

Peregrinus, Kirkaldy.

Peregrinus Kirkaldy 1904 Entom. XXXVII, 175.

Dicranotropis Van Duzee 1897 Bull. Buffalo Soc. N. H., V, 228 (nec Fieber).

1. *maidis* (Ashmead).

Delphax sp., Tyron 1889 Rep. Insect & fungus pests Queensland I, 193-6.

Delphax maidis Ashmead 1890 Psyche V, 323; textfigs.

Dicranotropis maidis Van Duzee 1897 Bull. Buffalo Soc. Nat. Sci., V, 240.

Peregrinus maidis Kirkaldy 1904 Entom., XXXVII, 176.

Testaceous, often tinged with orange, carinae paler; the apical three-fourths of the frons, the clypeus, first segment of the antennae and the second (except upper side of basal half), smoky brownish; lateral margins of scutellum dark brown. Femora dark brown.

Males dimorphic. Abdomen black; genital segments and laterally, paler. Longwinged form with tegmina hyaline, sometimes tinged with yellowish: costal, median and radial veins pale yellow, cubital and apical veins smoky, the latter suffusedly; fifth

* Mr. Muir has recently found brachypterous forms of both sexes.

to 7th apical cells apically smoky with a small hyaline spot on each, a black spot at apex of costal cell and a short black line at apex of clavus. Shortwinged form with hyaline tegmina, tinged with yellow, apex blackish brown, as also apex of clavus.

Females dimorphic, similar to the male.

Length: 4-5 mill. (macropt.), 3⅓ mill (brachypt.)

Hab: All through Queensland (Koebele's No. 2240) on *Zea mais*, *Cynodon dactylon* and *Bromus unioloides* (sec. Tryon); also in Hawaii on *Zea mais* and *Sorghum vulgare* (and occasionally on *Saccharum officinale*); Viti (iii), Florida and Texas.

The nymphs are pale orange yellow, immaculate except that there are small brownish rings around the spiracles.

Phacalastor, gen. nov.

Very close to *Peregrinus*, differing principally by the tegminal veins being very strongly granulate. Type *pseudomaidis*.

1. Apical veins of tegmina suffusedly infuscate............ ....*pseudomaidis*, sp. nov.
2. Apical part of tegmina with a dark semi-circular smudge, across tegmina and curving along the interoapical margin..................................*koebelei*, sp. nov.

1. *pseudomaidis*, sp. nov.

Very close to *Peregrinus maidis*, but the tegmina are strongly granulate with dark brown, and the nymphs are whitish, banded and spotted with dark brown.

Frons and antennae dark smoky brown, with a double (somewhat interrupted) line across the middle of the former. Femora smoky, apically black, tibiae pale annulated with black.

Males macropterous; genital segment black.

Females dimorphic; genital segment pale, a little infuscate. The shortwinged form has hyaline tegmina, with a large black spot apically.

Length: 3⅓-4 mill (macropt.); 2½ mill (brachypt.)

Hab: Queensland, Cairns (vii-viii) on grasses, casually on sugar cane (Koebele's No. 2236).

2. *koebelei*, sp. nov.

Allied to the typical species, but larger and stouter, posterior margin of pronotum less emarginate; tegminal granules much

larger and darker. Pronotum and scutellum darker. Frons blackish brown with many pale yellowish specks, base of clypeus pale. Anterior coxae and a round spot on mesopleura dead black; anterior and intermediate legs brownish black, more or less annulate with pallid; posterior legs more or less pale. Tegmina hyaline with bright black granules, the transverse apical line suffusedly blackish brown, the color continuing curvedly from apex of clavus to exteroapical angle, forming a rough semi-circle; second and third apical veins suffusedly brownish black. Abdomen mostly black except anus, etc.

Male genital segments black.

Female genital segments black, ovipositor pale.

Length: $3\frac{3}{4}$-$4\frac{1}{8}$ mill (always longwinged).

Hab: Queensland, Cairns (vii-viii, Koebele's No. 2248), on grasses.

Stenocranus, Fieber.

Stenocranus Fieber 1866 Verh. Zool. bot. Ges. Wien XVI, 519, Pl. VIII, f. 3.

1. *agamopsyche*, sp. nov.

Differs from *S. saccharivora* (Westwood) by the much shorter, anteriorly rounded (dorsally) head, and by the color; from the other species, by the immaculate tegmina of which only the apices of the apical veins are dotted with dark brown; there is also a very short, narrow line at the apex of the clavus; the other species (except *saccharivora*) have a longitudinal smoky smear on the tegmina.

Testaceous; frons and clypeus, between the keels, black. Tegmina pale cinereo flavous, marked as above. Tergites testaceous with a sublateral suffused blackish stripe longitudinally on each side. The eyes are distinctly more rounded than in the species with striped tegmina, and are shorter in proportion to their width.

Length: 5-6 mill.

Hab: Queensland, Cairns (vii-viii, Koebele's No. 2242), on grasses and sedges.

2. *saccharivora*, (Westwood.)

Delphax saccharivora Westwood 1833 Mag. Nat. Hist., VI, 413 figs. 54a-c.

Stenocranus (?) *saccharivorus*, Van Duzee 1897 Bull. Buffalo Soc. V, 232.

Mr. Ballou of the West Indian Dep. of Agriculture has recently sent me specimens of this in all stages, enabling me to confirm Van Duzee's doubtful reference to *Stenocranus*, but too late to present a detailed study in this paper. The egg-slits are much more profusely covered with waxy substance than in *Perkinsiella*. approaching more, so my colleague Mr. Swezey informs me, to the condition of certain North American forms. The delicate pale green, immaculate adult cannot be mistaken for any other species; the head in profile is long and acute anteriorly. It is stated by Ballou (1905 West Indian Bull., VI, 41) to be of little importance as a pest in the Antilles, though formerly, some 70 years ago, it was, according to Westwood, Johnstone and others, exceedingly destructive in certain of the islands.

Hadeodelphax, gen. nov.

Allied to *Stenocranus* but differing by the form of the head, the venation, etc.

Dorsally the head is elongate, subquadrangular, extending well beyond the apical margin of the eyes; near the anterior margin of the eyes (but a little below) the lateral keels bifurcate at an acute angle, the inner keels meeting acuminately a little beyond the apex of the vertex; the latter is keeled medianly as far as the apical margin (dorsally) of the eyes, where it forks on each side at an obtuse angle meeting the inner forks of the lateral keels. Head much narrower than the pronotum. Eyes longer than broad, suboblique. Ventrally, the frons is somewhat narrow, widening a little apical of the eyes; lateral keels sinuate; these, with the median keel, strongly marked. No forking visible on frons. Antennae short. Clypeus tricarinate. Pronotum tricarinate, laterally straightly divergent, ending just before posterior margin. Scutellum tricarinate. Tegmina with about 9 apical areas, the base of the fourth not reaching as far basal as that of the third, the third not as far as the second, the second not as far as the first, the first not as far as the fifth. Posterior tibiae and tarsi about equally long.

1. *pluto*, sp. nov.

Blackish piceous; antennae and legs testaceous. Tegmina dark smoky, first and second apical cells and apex of costal cell,

hyaline; commissure whitish, with a black spot near apex of clavus.

Length: 4¼ mill.

Hab: Queensland, Cairns (vii-viii, Koebele's No. 2247).

Gelastodelphax, gen. nov.

Somewhat allied to *Peregrinus* Kirkaldy. Head dorsally scarcely extending anteriorly beyond the eyes. Vertex transverse, lateral keels forking, the inner forking forming two acutangled apices; beyond that there is a smooth area, on which keels are obsolescent. The frons has a central keel; the lateral converging anteriorly, the lateral ones are subparallel, meeting keels of genae at an acute angle; antennae slender, second segment reaching well beyond base of clypeus, which continue on to the scutellum. Tegmina very short. Posterior tibiae much longer than tarsi, spur with nearly 50 teeth.

1. *histrionicus*, sp. nov.

Vertex smoky brown; clypeus yellowish testaceous; frons, antennae, sterna, legs and tegmina yellowish, the last named being broadly black basally, this continuing on to mesopleura. Pronotum, scutellum and basal half of abdomen whitish testaceous, a broad black band across the middle above; apical of this, pale red brown, becoming paler and more sordid apically. Sternites apically pale red brown. Genital segment mostly black. Tegmina reaching to a little beyond middle of body, apically truncate.

Length: (male), 2½ mill.

Hab: Queensland, Bundaberg, on Sandhills (x).

Smicrotatodelphax, gen. nov.

Somewhat allied to *Delphacinus*, but the head and eyes are larger proportionately, the antennae and the frons different. The type is the smallest Fulgorid known to me.

Head, especially the eyes, very large, the latter extending laterally as far as the base of the tegmina, and posteriorly nearly touching the base of the pronotum. Vertex with lateral keels forking at about one-third of the length of the head (dorsally), meeting acutely on the top of the head ,continuing to apex of frons as a single keel. Antennae reaching beyond base of clypeus. Pronotum tricarinate, the lateral keels straight, diverging

posteriorly, but practically reaching the posterior margin of pronotum. Scutellum transverse, with 3 somewhat obscure keels. Tegmina not nearly reaching apical margin of abdomen, rounded apically. Tibial spur with about 13 teeth.

1. *perkinsi*, sp. nov.

Testaceous, frons embrowned, eyes black. Tegmnia hyaline. Tergites hyaline. Tergites basally more or less pale orange brown, apex more or less black.

Length: (males), 1½ mill.

Hab: Queensland, Cairns.

Ectopiopterygodelphax, gen. nov.

Distinguished by the large, polished, convex peilet of chitin in the middle of the tegmina. The form of the head is different from that of any other Asiracid known to me.

Vertex long triangular, longer than pronotum, and longer than its own width at base; lateral margins carinate, meeting anteriorly in a slightly rounded acute angle, well beyond the apical margin of the eyes; median keel present but no other keels dorsally. Posterior margin of vertex slightly roundly emarginate. Eyes longer than wide, head and eyes wider than the length of the vertex. Frons suboval, lateral margins rounded; median keel strong and entire; lateral keels acute, starting from lateral keel of vertex at a lower (inverted) elevation than the middle keel, so that for at least the basal half of the length of the frons, the middle keel is strongly visible in profile; lateral keels apically remote from middle keel; apical margin of frons truncate. Genae narrow. Clypeus tricarinate. Antennae very short. Pronotum anteriorly rounded, posterior margin lightly emarginate, lateral keels remote anteriorly from middle keel (practically a continuation of the head keels.) Scutellum with 3 entire keels. Tibial spur short, with a large number of pale, translucent, ill-defined teeth.

1. *eximius*, sp. nov.

Pale green, faintly marked, mostly in interrupted longitudinal lines, with brown. Apex of frons, clypeus, genae (partly), sterna and abdomen, black. Tegmina subhyaline, pale brown; a large spot near the base a wide band across the middle of the corium

(almost encircling the black pellet), and 3 large spots at apex of costal cell and on the basal apical-cells.

Length: $3\frac{1}{2}$ mill.

Hab: Queensland, Cairns (vii).

Family Eutropistidae.

(=*Tropiduchida* Stal.)

I am a little uncertain as to the constituents of this; the antennal structure is often very obscure and I have not been able to examine it in some forms as I would wish. The subcostal cell is present and the costal cell usually provided with transverse veins; the anal vein runs into the apical angle of the clavus. The last segment of the rostrum is moderately long.

Monopsis Spinola, which Stal places in his Tropiduchida, appears to me to belong to the Dictyophorinae.

Australian and Vitian Genera.

1. Subcostal cell absent or exceedingly narrow.............
 ....1. *Ossa* Motshulsky

1a. Subcostal cell present, costal cell with many transverse veins ....2.

2. Head at least twice as long as wide..5 .*Rhinodictya* gen. nov.

2a. Head little, if at all, longer than wide...................3.

3. Frons with an oblique keel on each side between median and lateral keels.....................4. *Vanua* gen. nov.

3a. No oblique keels...4.

4. Vertex transverse; apical area of tegmen large..........
 ....3. *Peltodictya* gen. nov.

4a. Vertex elongate, longer than wide; apical area very narrow...............................2. *Daradax* Walker.

Ossa Motshulsky.

Ossa Motsh., 1863 Bull. Soc. Nat. Moscou XXXVI, 2: 106; Melichar 1903 Hom. Ceylon 49.

Both the species hereinafter described, have the head more elongate than in the Sinhalese *O. dimidiata*.

1. Six red specks on vertex arranged longitudinally in 2 rows; length less than 7 mill..............*venusta* sp. nov.

2. Six red specks on vertex arranged longitudinally in 3 rows, (middle row sometimes obsolescent); length over 7 mill. . . . . *formosa* sp. nov.

1. *venusta* sp. nov.

Pale greenish testaceous; vertex with six crimson specks, 3 on each side of the median keel, in a longitudinal row; lateral keels of scutellum more or less crimson, also a speck at the interobasal angle of clavus and a speck on the commissure about the middle. Leg spines black. Vertex about $\frac{1}{2}$ to $\frac{3}{4}$ longer than broad, well produced in front of eyes, rounded anteriorly. Frons suboval, about twice as long as wide.

Length: $6\frac{1}{2}$-$6\frac{3}{4}$ mill.

Hab: Queensland, Cairns (viii), Kuranda (viii), arboreal.

2. *formosa* sp. nov.

Closely allied to the preceding but larger. There are six specks also on the vertex, but they are orange red and are arranged longitudinally in 3 rows of two each, the outer not being parallel but following the curve of the head, the middle two are on the carina (sometimes obsolescent) and are placed a little posterior to the corresponding lateral specks. The tegmina are speckled with crimson as follows: one each side on the commissure a little basal of its middle, and one or two at the anterior angle and 2 or 3 exteriorly—on the subapical line.

Length: $7\frac{1}{8}$-$7\frac{1}{4}$ mill.

Hab: Queensland, Bundaberg (ix-xii, i), Brisbane (xi), arboreal.

There is nothing remarkable, apparently, about the nymphal instars.

Daradax Walker.

Daradax Walker 1857 J. P. Linn S. London I, 85.

A beautiful nymph from Viti (iii) belongs, I think, to this genus.

Peltodictya, gen. nov.

Allied closely to *Epora* Walker, but the apical area of the tegmina is much longer, and there are two very distinct, though sinuate, subapical lines.

Vertex about twice as broad as long, extending a little in front of the eyes, rounded anteriorly, rectangularly emarginate

posteriorly, strongly carinate medianly. Eyes prominent, but not extending laterally nearly as far as the pronotum. Frons more than twice as long as broad, strongly carinate medianly. Pronotum deeply acutangularly emarginate, with a strong median keel, and a lateral oblique one on each side. Scutellum longer than vertex and pronotum together, with 3 strong keels, the lateral ones sinuate, uniting anteriorly with the median. Radial and median veins nearly approximate at base, the former forking somewhat near the base, outer branch re-forking; median not forked; cubital forked a little nearer the apex than the radial. Costal cell with about 12 simple crossveins; subcostal cell present. A large number of apical cells and about 8 subapicals. Tibiae with 3 spines.

(I do not think *Epora* Melichar is the same as *Epora* Walker, or as *Peltodictya*, as Melichar does not show even one clear subapical line.)

1. *kurandae*, sp. nov.

Grass green. Eyes and genital segments partly brownish. Veins lightly and shortly piligerous.

Length: $11\frac{3}{4}$ mill.

Hab: Queensland, Kuranda (viii) on grass.

Vanua, gen. nov.

Allied to the last described, but with only one at all regular subapical line, and the frons has oblique keels.

Vertex anteriorly rounded, transverse, extending a little in front of eyes, medianly carinate on the basal two-thirds; posteriorly acutely emarginate. Frons about twice as long as wide, medianly keeled on the basal three-fourths. Clypeus carinate medianly, the keel (at the apical margin of frons) proceeding straight on each side of median keel for more than half of frontal length, not quite reaching lateral keels. Clypeus keeled laterally. Pronotum wider posteriorly than head, carinate medianly, lateral keels curved convergingly, meeting anteriorly in an acute angle; anteriorly nearly on a level with anterior margin of eyes, posteriorly deeply acutely emarginate. Scutellum about as long as vertex and pronotum together, tricarinate; the lateral keels meeting anteriorly. Tegmina elongate, costal cell broadened posteriorly, with some 18 or 19 simple transverse veins; subcostal cell present. Radial forked near base, cubital forked close to it, a little nearer apical margin; median

vein simple. Apical third of tegmina subreticulate. Tibiae with 3 spines.

1. *vitiensis*, sp. nov. (Pl. XXVII, figs. 7-9.)

Pale greenish testaceous; tegmina hyaline, veins more or less greenish testaceous.

Length: 10-11 mill.

Hab: Viti Isls. (iii), arboreal.

Nymphs: The vertex is angular anteriorly, and angulately emarginate posteriorly. The pronotum is acute-angled anteriorly, reaching almost to apical margin of eyes, posteriorly emarginate. Whole insect medianly carinate from apex of vertex to apex of abdomen. Ventrally, the frons is nearly twice as long as wide, carinate laterally and medianly, the latter keel not reaching anterior margin, and at visible base of frons sending out forks at right angles which curve around and meet again at apex of frons. The transverse space between this basal keel and the anterior margin of the vertex, is dorsal and is rounded anteriorly (as seen dorsally). It is crowded with sensory organs, and lightly keeled medianly. The space between lateral and sublateral keels on frons is also provided (much less thickly) with sensory organs. Eyes prominent. Nota and tegminal pads with a few sensory organs.

Pale greenish testaceous, a crimson stripe (or keel) from apex of vertex to apex of abdomen, broadening suffusedly as a rule about the middle of each part. A black spot at interoposterior angle of tegminal pad.

Length: 5 mill. (Pl. XXVII, figs. 6-7).

Rhinodictya, gen. nov.

Has a considerable superficial resemblance to *Hasta paupera*. Head slightly ascending. Vertex about as long as pronotum and scutellum together, angularly emarginate at base, a lateral keel on each side and a median. Frons with a lateral keel on each side and a median, also a curved submedian keel on each side, becoming obsolete on the basal half. Pronotum tricarinate, angularly rounded anteriorly, deeply rectangularly emarginate posteriorly. Scutellum short, tricarinate, the lateral keels rounded, meeting anteriorly. Costa arched, costal cell with about 18 transverse veins; subcostal cell present, stigma absent. Apical fourth of tegmina reticulate, no definite sub-

apical line. (Basal venation as in *Peltodictya*). Posterior tibiae with three spines.

1. *quaesitrix* sp. nov.

Pale yellowish green, paler beneath. Tegmina hyaline, veins pale yellowish green.

Length: 11-12 mill.

Hab: Queensland, Cairns (viii) on grass.

Family Achilidae.

The antennae in the Australian genera are small and inconspicuous.

1. Tegmina entirely bright red..............1 *Achilus* Kirby.
1a. Tegmina, if reddish, only so on the costal cell and the veins. .... 2.
2. Frons strongly impressed transversely; not or very obsolescently carinate. (A white band on the face)..2 *Aristyllis* gen. nov.
2a. Frons not impressed transversely; more or less strongly carinate medianly. ....3.
3. Apical cells of tegmina all (or all except one or two) not longer than wide..................10 *Salemina* gen. nov.
3a. Apical cells of varying length..........................4.
4. Vertex very transverse (not carinate medianly, and 2 white bands on the face)..................4 *Pyrrhyllis* gen. nov.
4a. Vertex not transverse, or if so, very slightly............5.
5. Vertex obsolescently carinate medianly, somewhat deeply rotundately impressed in the middle..11 *Francesca* gen. nov.
5a. Vertex strongly carinate medianly; not impressed (or if so, longitudinally or very slightly, between median and lateral keels) ....6.
6. Lateral keels of frons meeting at its base and forming an angle there. ....5 *Majella* gen. nov.
6a. Lateral keels of frons not meeting at its base, which is more or less widely truncate (or slightly angularly emarginate). ....7.
7. Vertex basally practically truncate, except at extreme lateral margins. ....8.
7a. Vertex basally distinctly angulately emarginate.........9.
8. Vertex wider at base than long medianly...7 *Eurynomeus* gen. nov.
8a. Vertex distinctly longer than wide....6 *Phenelia* gen. nov.

9. Tegmina smooth, not granulate; veins thin and prominent, not granulate. Face with two transverse white bands................................3 *Benella* gen. nov.
9a. Tegmina granulate on the costal cell and sparsely elsewhere, veins stout and prominent, granulate; frons not banded. ....9.
10. Head produced distinctly in front of the eyes...8 *Argeleusa* gen. nov.
10a. Head not or very slightly produced....9 *Cythna* gen. nov.

Aneipo is not included in this table.

Achilus Kirby.

Achilus Kirby, 1818, T. Linn. Soc. London. XII. 474.
Achilius Spinola, 1839, Ann. S. E. France, VIII, 320.
Achillus Am. and Serv., 1843, Hemipteres, 524.

1. *flammeus* Kirby.

Achilus flammeus Kirby, op. cit. supra 475, Pl. XXIII, f. 13.
Hab: "Australia" (Coll. Kirkaldy.)

Aristyllis gen. nov.

Vertex slightly declivous, more or less confused with the frons; the lateral margins fork, about their middle, (as seen dorsally), the inner keels meeting at an angle on the anterior margin (as seen dorsally), carinate medianly, posterior margin emarginate angulately. Frons obsolescently carinate medianly, the apical half excavated horseshoe-shaped. Clypeus more strongly carinate medianly, carinate (as also frons) laterally. A white opaque band across face. Eyes large, each about as wide as vertex. Ocelli distinct. Pronotum short, wider than head, tricarinate. Scutellum tricarinate. Tegminal venation as figured (all the Australian genera are very similar, differing principally in the relative proportions of the apical cells), not granulate. Legs spineless, or with one spine. Type *A. aristyllis*.

This genus is apparently *Plectoderes* Fowler (in part); I say "in part," because Fowler's genus is obviously heterogeneous. In *Plectoderes* Spin., the head is stated (and figured) to be fully as wide as the pronotum; in all the Australian Achilinae, the head is distinctly, often very much, narrower.

1. Scutellum anteriorly black; a white wedge across the middle of the clavus and a white stripe across costal cell. .... 2 *omphale* Kirkaldy.

1a. Scutellum uniform dark or pale ferruginous; no white stripes on tegmina.. 2.

2. Scutellum dark ferruginous; a large bluish black spot near apex of costal cell................ 1 *aristyllis* Kirkaldy.

2a. Scutellum pale ferruginous; costal cell slightly infuscate. .... 3 *adippe* Kirkaldy.

1. *aristyllis*, sp. nov.

Head gradually shading from brownish ferruginous at base of vertex (and also on apical half of clypeus) to black near apex of frons. Eyes and scutellum dark ferruginous. Anterior half of pronotum blackish, posterior half whitish. Sterna, rostrum and legs mostly testaceous, anterior femora black, the base and a band near the apex, pale. Abdomen mostly black. Tegmina subhyaline brownish-yellow, a tiny white speck about middle of commissure, the basal margin, a spot at base of costal cell, apical half of costal cell,and a spot about the middle of the clavus, blackish, with a metallic-blue glint; some of the veins sanguinescent. Rostrum reaching just beyond posterior coxae. Apical angles of vertical disk acute. Tibiae spineless.

Length: $4\frac{1}{2}$ mill to apex of abdómen; $5\frac{3}{4}$-$6\frac{1}{2}$ to apex of tegmina.

Hab: Queensland, Kuranda (viii), Cairns (viii).

2. *omphale*, sp. nov.

Differs from the typical species by being shorter and broader and differently colored; vertex shorter.

Vertex, pronotum anteriorly in the middle, apex of clavus, pale ferruginous. Frons, clypeus, pronotum anterolaterally, anterior and posterior third of scutellum, sterna, abdomen, etc., black or blackish. Middle third of scutellum bright ferruginous, posterior margin of pronotum testaceous. Tegmina hyaline, pale yellowish brown, basal margin narrowly, a spot near middle of costal area, and a stripe across the clavus (nearer apex than base), opaque white; apex of costal cell more or less sanguineous, a large metallic bluish-black spot just basal of this. Anterior legs and intermediate and posterior femora more or less black, anterior femora not pallidly banded posteriorly, in-

termediate and posterior tibiae and tarsi widely pallid, at least apically. Frons banded as in the type. Vertex shorter than in the type, the apical angle of the disk rectangular; rostrum reaching to apex of posterior coxae.

Length: 4 mill to apex of abdomen; $5\frac{1}{2}$ to apex of tegmina.

Hab: Queensland, Nelson (vii).

3. *adippe*, sp. nov.

Pale ferruginous, base and middle of frons blackish brown, banded with white as in the preceding species. Sterna and legs pale. Abdomen more or less marked with black. Tegmina pale yellowish hyaline, veins mostly darker, costal cell dark apically. Structure of head similar to the type. Legs not spinose.

Length: (male) $5\frac{1}{8}$ mill.

Hab: Queensland, Cairns (viii).

Benella, gen. nov.

Characters of *Aristyllis*, but frons not excavated.

1. *aliena*, sp. nov.

Pale ferrugineous, face with two transverse white bands. Pronotum testaceous; tegmina hyaline, costal cell more or less infuscate; veins more or less pale sanguineous. Legs etc. pale, anterior and intermediate tibiae annulate with dark brown. Abdomen dark brownish black, posterior margin of each segment narrowly pale. Posterior tibiae with a spine.

Length: 3 mill to apex of abdomen; $4\frac{3}{4}$ to apex of tegmina.

Hab: New South Wales, Sydney (i).

Pyrrhyllis, gen. nov.

Allied to the preceding, but the vertex is very transverse and the frons is not impressed transversely; from *Phrygia* Stal it is apparently distinguished by the presence of a distinct keel separating vertex and frons.

Vertex not prominent, but more or less arched anteriorly, not reaching anteriorly as far as the eyes; very transverse, emarginate posteriorly. Frons a little convex, carinate median-

ly and laterally, as also clypeus. Face with two transverse white bands.

1. *pyrrhyllis*, sp. nov.

Pale yellowish testaceous, more or less pallidly infuscate. Scutellum infuscate between the keels. Abdomen mostly blackish. Tegmina hyaline, pale smoky, basal veins dark brownish, costa and apical veins sanguineous. Vertex rather obscurely keeled medianly.

Length: 3 mill to apex of abdomen; 4½ to apex of tegmina.
Hab: Queensland, Bundaberg (xi).

Majella, gen. nov.

Distinguished from any of the other Australian Genera, by the lateral keels of the frons meeting in an angle at the base, and the genae being subfoliaceous and dorsally prominent. General appearance of *Phenelia*, but the veins are strongly granulate, and the apical third of tegmen is more or less declivous. Posterior tibiae with a spine.

1. *majella*, sp. nov.

Pale cinereous or testaceous, a thin short dark brown line on vertex anteriorly on either side of median keel. Scutellum suffused with fulvescent, posterior part of keels pale yellowish. Tegminal veins mostly darker, thickly granulate all over, granules mostly pale; apex of clavus sanguineous with a large bluish-black spot; base of first apical cell sanguineous. Abdomen mostly brownish black. The lateral margins of the vertex converge slightly, but do not meet anteriorly. Frons posteriorly somewhat excavate, the lateral margins there being broad and subvertical.

Length: (male) 4; (female) 4⅞-5 mill.
Hab: Queensland, Nelson (vii), Cairns (viii).

Phenelia, gen. nov.

Allied to *Elidiptera* Spin., but differs by the vertex being strongly carinate in the middle, posterior tibiae not spinose, etc.*

* *Elidiptera* Walker (not *Elidiptera* Spin., as Melichar states in his "Mon. Flatiden") is a synonym of *Phalaenomorpha* Am. Serv. (*Flatoides* Guerin, Melichar.)

Vertex longer than wide, produced before the eyes, lateral margins straight, slightly converging anteriorly, anterior and posterior margins truncate, strongly carinate medianly. Frons and clypeus as in *E. advena* Spin., except that the former is not so far produced basally. Pronotum and scutellum tricarinate. Tegmina in form similar to *E. advena*, but not quite so arched at the shoulder, not at all granulate; radial and cubital forked at about one-third of the length of the tegmen.

1. *elidipteroides*, sp. nov.

Head, pronotum, sterna and legs, yellowish testaceous, a little browner on vertex. Scutellum dark ferruginous. Tegmina hyaline, tinged with cinereous; keels of scutellum and basal veins of tegmina more or less obscurely sanguineous, apical and subapical veins, apex of costal cell and the entire apical cell adjoining, bright sanguineous; the base of that apical cell, bluish black. Abdomen mostly black.

Length: $2\frac{1}{2}$ mill to apex of abdomen, $4\frac{1}{2}$ to apex of tegmina.
Hab: Queensland, Cairns (vii-viii).

Eurynomeus, gen. nov.

Apparently somewhat allied to *Phrygia* Stal. Vertex slightly declivous, scarcely produced before eyes, subtruncate anteriorly, not shorter than wide; about one-half longer than the pronotum, medianly carinate, this keel extending to posterior angle of scutellum, though obsolescent on pronotum. Frons a little longer than wide, median keel extending to apex of clypeus, which is not very distinctly sutured off from frons. Pronotum posteriorly obtusangulately emarginate. Scutellum tricarinate. Tegmina not granulate, radial and cubital forked basally of the middle at about the same place. Posterior tibiae with a spine.

1. *australiae*, sp. nov.

Stramineous; a line on either side of median keel of vertex and a rectangular spot on each side of frons at base, a spot on mesopleura externally, black, lateral margins of pronotum and scutellum brownish. Tegmina hyaline, costa, etc., colorless, most of the rest pale smoky, a spot at the exteroapical angle and two or three veins between it and the costal cell, brownish. Tergites sordid yellowish, more or less lined with orange.

Length: 3 mill to apex of abdomen; $4\frac{3}{4}$ to apex of tegmina.
Hab: Queensland, Cairns (vii).

Argeleusa, gen. nov.

Allied to *Francesca* but with different head-form. Vertex longer than wide, distinctly produced in front of the eyes, rounded anteriorly. Frons elongate, lateral margins sinuate, concavely rounded basally, convexly rounded and widened apically; base narrow, obtuse-angulately emarginate. Tegminal veins, costal cell etc. granulate, veins thick and prominent. Tibiae obscurely spined near the base.

1. *kurandae*, sp. nov.

Pale olive brown, paler beneath. Vertex with four longitudinal blackish brown lines, frons and clypeus minutely mottled with brownish. Pronotum with a short blackish-brown line on each side of median keel and 5 spots of same color from thence to lateral margins. Scutellum between lateral keels minutely mottled with brownish, with 4 small, more or less distinctly ocellated spots, 2 anteriorly and 2 posteriorly. Tegmina hyaline, pale cinereous, veins pale brownish and white variegated, spotted with brownish especially on clavus costal cell and apical parts. Anterior and intermediate legs banded with pale brown. Abdomen more or less dark brownish.
Length: $5\frac{1}{2}$ mill.
Hab: Queensland, Kuranda (viii).

Cythna, gen. nov.

Differs from the last by the head being scarcely if at all produced before the eyes. The lateral keels of the vertex fork just before their middle, the outer forks diverging a trifle, the inner rounding gradually and meeting the median keel at the apical margin. Frons nearly as broad apically as long, narrowing a little towards the base. Tegmina granulate, apical third more or less declivous.

1. *laon*, sp. nov.

More or less pale ferrugineo-testaceous, vertex and scutellum more or less blackish about the keels. Scutellum also suf-

fused with dark brown. Tegmina subhyaline, cinereous, mottled and granulate with blackish brown.

Length: $4\frac{1}{2}$-$4\frac{3}{4}$ mill.

Hab: Queensland, Cairns (viii).

I think another specimen ($4\frac{1}{4}$ mill) from Kuranda (viii) belongs to this.

Salemina, gen. nov.

Vertex slightly declivous, convex, somewhat obscurely carinate medianly, sinuately rounded anteriorly. Frons elongate, lateral margins sub-parallel, slightly divergent posteriorly, carinate medianly. Tegminal veins thick, prominent, not granulate, apical cells short, the 3 middle ones scarcely longer than wide. Posterior tibiae with an obscure spine.

1. *francescophila*, sp. nov.

Cinereo-testaceous. Frons and scutellum very finely and somewhat closely speckled with dark brown. Pronotum tuberculate latero-posteriorly with blackish brown. Tegmina hyaline, cinereous, more or less finely marmorate with brown, veins on apical third whitish. Costa and apical margin of clavus, more or less closely spotted with blackish brown. Anterior and intermediate legs pallid, annulated with blackish brown.

Length: 5 mill.

Hab: Queensland, Cairns (viii).

Francesca, gen. nov.

Distinguished by the somewhat deep, circular impression on the middle of the vertex. Vertex longer than wide, produced a little in front of the eyes, the lateral margins forking near apex, making the apical margins tridentate, the median angle being acute. Pronotum with an impressed point on each side of middle keel, almost rectangularly emarginate posteriorly. Scutellum diamond shaped, much longer than the other genera.

1. *saleminophila*, sp. nov.

Sordid testaceous, frons laterally with a row of blackish brown spots. Posteriorly three-fifths of the disk of scutellum dark brown, lateral parts of scutellum (exterior to keels) with a large thin blackish brown subtriangular ocellus. Tegmina hyaline,

thickly spotted and smudged with brownish cinereous; veins on apical third white. Legs pallid, anterior and intermediate tibiae annulate with black. Abdomen brown, posterior margin of each segment narrowly pallid-sanguineous.

Length: ·6 mill.

Hab: Queensland, Lucinda point (vii).

Ancipo, gen. nov.

Vertex with disk transverse, depressed, apically a little angulate, produced in front of the subrotundate eyes; basally roundly emarginate; lateral keels highly elevated, diverging a little posteriorly and continuing beyond base of disk. Frons widening apically, this part foliaceous and subvertical, acute, the disk medianly keeled. Clypeus laterally carinate curvedly, subfoliaceous. Pronotum much wider than the head, tricarinate, the lateral keels uniting anteriorly, the pronotum produced triangularly in the middle anteriorly. Scutellum tricarinate. Tegmina broad, rounded apically; costal cell broad, not transversely veined; radial and median veins approximating at base, the former forked about one-fifth of the length of the tegmina; cubital forking immediately basally of the forking of the outer radial. Apical cells short. Anterior femora and tibiae about equally long, posterior tibiae with one strong spine.

1. *diva*, sp. nov.

Bright pale yellow; pronotum (except laterally), clavus (except apical fourth and a spot near posterior angle of scutellum) and a stripe near apical margin of tegmina widening anteriorly, sanguineous. Scutellum brownish; sterna testaceous. Tegmina (especially costally) speckled with blackish brown. Wings milky white. Abdomen bright pale green.

Length: 6¼ mill to apex of abdomen, 11 mill to apex of tegmina.

Hab: Queensland, Kuranda (viii).

Fam. Derbidae.

1. Head (more or less) and anal vein of clavus (strongly) granulate....................(Subfamily Kermesiinae) 2.

1a. Anal vein not granulate (last segment of rostrum much shorter than the penultimate, widened, often annuliform ....(Subfamily Derbinae) 7.

2. Last segment of rostrum fairly long....................3.
2a. Last segment of rostrum subannuliform, conspicuously short..6.
3. Head strongly carinate longitudinally in the middle...... ....1. *Phaconeura*, gen. nov.
3a. Head not carinate medianly..........................4.
4. Lateral carinate of the head narrow and acute, sensory organs less conspicuous; pronotum not extending laterally farther than the antennae, not so far as the tegulae.....5.
4a. Lateral carinae broader and flattened, sensory organs conspicuous, pronotum extending laterally much farther than the antennae, farther than the tegulae................ ....4. *Phaciocephalus*, gen. nov.
5. Lateral carinae of frons (ventrally) parallel; vertex linear, widening out triangularly laterally......2. *Nisia* Melichar.
5a. Lateral carinae narrowing basally (ventrally); vertex linear entirely........................3. *Suva*, gen. nov.
6. Pronotum laterally foliaceous, sinuate, recurved, laterally almost enclosing antennae. Vertex triangular.......... ....5. *Basileocephalus*, gen. nov.
6a. Pronotum more or less normal, vertex truncate apically.. ....6. *Thyrocephalus*, gen. nov.
7. Antennae more than three times as long as wide.........8.
7a. Antennae not twice as long as wide...................10.
8. Antennae more or less flattened, with very conspicuous sensory organs.....................................9.
8a. Antennae subcylindric, sensory organs indistinct........ ....9. *Heronax*, gen. nov.
9. Head strongly elongate, curved and recurved, subascendant, length greater than that of nota.7. *Swezeyia*, gen. nov.
9a. Head foliaceous but not longer than nota, not recurved... ....8. *Phantasmatocera*, gen. nov.
10. Head wider than pronotum....10. *Philadelpheia*, gen. nov.
10a. Head narrower than pronotum......................11.
11. Tegmina elongate, narrow, nearly three times as long as wide............................11. *Sardis*, gen. nov.
11a. Tegmina not more than twice as long as wide........12.
12. Lateral margins of frons practically contiguous between the eyes...13.
12a. Lateral margins of frons not nearly contiguous between the eyes...14.
13. Vertex extending far beyond the eyes..12. *Kaha*, gen. nov.

13a. Vertex extending but little beyond the eyes............ ....13. *Levu*, gen. nov.
14. Lateral margins of head noticeably sensorized.......... ....14. *Pyrrhoneura*, gen. nov.
14a. Lateral margins of head indistinctly sensorized......... ....15. *Rhotana*, Walker.

Nisia Melichar.

Nisia Melichar, 1903 Hom. Ceylon 53.

This genus seems to be but slightly differentiated from *Kermesia* Melichar. The last segment of the rostrum in both is not very short.

1. *atrovenosus* (Lethierry.)

Mecnoplus atrovenosus Lethierry Ann. Mus. Genova. XXVI, 466.

Nisia atrovenosa Melichar 1903 Hom. Ceylon 53.

Hab: Queensland, Cairns (viii), Lucinda Point (vii); Viti Isles (iii); on grasses and sedges; also from Ceylon (my collection), Nias, Gunun, Sitol (Lethierry).

2. *grandiceps*, sp. nov.

Allied to the last ,but larger; the lateral margins of the head more highly raised. Head and nota sordid brownish testaceous, with a paler median line from apical margin of clypeus to posterior margin of scutellum.

Length: 2½-3 mill to apex of abdomen; 4¾-5 mill to apex of tegmina.

Hab: Queensland, Kuranda and Cairns (viii) on grasses and sedges.

Phaconeura, gen. nov.

Differs from *Nisia* by the head being strongly carinate longitudinally in the middle, and by the lateral margins being less elevated above the disk.

1. *froggatti*, sp. nov. (Pl. XXIX, figs. 5-6).

Piceous, tegmina paler, hyaline. Lateral margins and keels of head, pronotum and scutellum, clypeus, rostrum and legs,

veins, tegminal granules, posterior margins of tergites etc., yellowish testaceous.

Length: $2\frac{1}{2}$ mill to apex of abdomen, 4 mill to apex of tegmina.

Hab: New South Wales, Sydney (i).

1. *pallida*, sp. nov.

Differs from the type (*froggatti*), in being bigger and different in color.

Testaceous, scutellum (excluding keels) etc., fuscous. Abdomen blackish, except part of genital segment. Tegmina subhyaline milky, iridescent; veins whitish.

Length: $4\frac{1}{2}$ mill to apex of tegmina.

Hab: Queensland, Bundaberg (xi).

Suva, gen. nov.

Closely allied to *Nisia*, but the lateral margins of the frons are not parallel. In *Nisia*, the vertex proper consists of a very narrow, linear strip, which widens out triangularly at the lateral margins; in *Suva*, this widening is absent, and the tegmina are narrower and more elonate.

1. *koebelei*, sp. nov.

Orange yellow, darker or redder on scutellum and sterna, legs paler. Eyes black. Tegmina subopaque creamy, veins pale orange yellow; clavus (except sutural cell) dark or redder, orange; a longitudinal entire submedian dark brown band, widening a little apically, on the tegmina and another along the commissure apical of the claval apex.

Length: 4-$4\frac{3}{4}$ mill.

Hab: Viti Isles (iii).

Phaciocephalus, gen. nov.

Closely allied to *Suva*, but distinguished by the characters in the table.

1. *vitiensis*, sp. nov.

Sordid yellowish testaceous, lateral margins of scutellum broadly black, this continuing onto the tegmina in a broad me-

dian band, into which, near its middle, enters a narrow stripe arising near the extrobasal angle of tegmen. The ground color of tegmina is creamy, veins pale yellow. Legs pale sordid testaceous, apex of each segment narrowly black. Eyes and abdomen blackish.

Length: $4\frac{3}{4}$ mill.

Hab: Viti Isles (iii).

Basileocephalus, gen. nov.

Distinguished by the remarkable form of the pronotum. Head produced distinctly in front of eyes, vertex indistinctly separated from frons, the former elongate triangular, disk concave, the anterior converging lateral margins blunt, strewn thickly with sensory organs. Frons narrow, but the acute lateral margins not nearly contiguous. Clypeus rather longer than the head, stringly tricarinate. Antennae articulated remote from the genae, short, somewhat globose. Pronotum transverse, much wider than the head, medianly carinate, laterally foliaceous, recurved, practically enclosing the antennae except from in front. Scutellum polished, obsolescently carinate. Tegmina elongate, narrow. Tegulae subfoliaceous.

1. *thaumatonotus*, sp. nov.

More or less pale fulvotestaceous, a black spot on anterior ambulacra. Tegmina subhyaline, pale pinkish white, costal cell whitish, veins coralline, 2 or 3 more or less entire, narrow, dark brown longitudinal stripes on tegmina. Genital segment dark.

Length: 3 mill to apex of abdomen, $6\frac{1}{4}$ to apex of tegmina.

Hab: Queensland, Kuranda (viii).

Thyrocephalus, gen. nov.

Vertex a little longer than wide, produced in front of eyes, middle of the disk sunken, lateral margins widely flat and raised, strewn with sensory organs, converging slightly not meeting anteriorly, anterior margin truncate, posterior margin acute, elevated, truncate (the lateral margins are produced a little posteriorly beyond the base) posterolateral angles acute. Frons narrow, lateral margins acute, strongly elevated vertically, wider apically than basally, a little constricted medianly. Antennae short, rather smoothly subglobose. Pronotum wider than head,

roundly rectangular posteriorly, somewhat obsolescently tricarinate, scutellum obsolescently 5-carinate. Tegulae extending laterally farther than pronotum. Costa granulate.

1. *leucopterus*, sp. nov. (Pl. XXIX, figs. 6-7).

Head, pronotum, legs etc., pale testaceous, frons more or less sordid. Scutellum pale yellow. Abdomen blackish posterior margin of each segment narrowly pallid. Tegmina and wings subopaque milky, apex of costal cell infuscate.

Length: 3-3½ mill to apex of abdomen, 5-6 to apex of tegmina.

Hab: Queensland, Cairns (viii), on grasses.

Swezeyia, gen. nov.

Vertex produced far in front of eyes, ascendant, somewhat recurved, narrowed in front of eyes and then gradually widened, subspatulate; deeply rectangularly emarginate basally, the angle of the emargination being on a level with the anterior margin of the eyes. Frons subconstricted at the eyes, widening out a little basally. Antennae elongate, flattened, about twice as long as an eye, set on each side of its disk with a raised mass of sensory organs. Clypeus obsolescently tricarinate. Pronotum acutangularly emarginate.

1. *lyricen*, sp. nov. (Pl. XXX, f. 10).

Pale yellowish, head and pronotum more testaceous. Antennal sensory organs dark gray. Eyes black. Pronotum sublaterally with a dark grey spot. Tegmina hyaline, greyish longitudinal stripe down the middle, some of the veins sanguineous.

Length: 2½ mill to apex of abdomen, 5¼ to apex of tegmina.

Hab: Viti Isles (iii).

Phantasmatocera, gen. nov.

Head elongate, extending well in front of eyes, frons and vertex confused; disk depressed, lateral margins highly elevated, subacute, converging towards anterior margin of head, but not contiguous either there or ventrally. Antennae much as in *Swezeyia*, but not so long nor quite so conspicuous. Pronotum acutangularly emarginate. Scutellum and clypeus obsolescently carinate. Tegmina narrow, elongate. Type *arborea*.

1. *arborea*, sp. nov.

Testaceous, a broad dark brown stripe laterally on genae through eyes to posterolateral angle of scutellum. Eyes and clypeus blackish brown. Tegmina hyaline, milky, a somewhat faint mediolongitudinal smoky stripe; some veins sanguineous, some yellowish.

Length: 2¼ mill to apex of abdomen, 5 to apex of tegmina.

Hab: Queensland, Kuranda (viii) on trees.

2. *vitiensis*, sp. nov. (Pl. XXVIII, figs. 1-3).

Closely allied to the type ,but the vertex is broader and not so convergent anteriorly; also the ventral part of the frons is practically parallel throughout, while in *arborea* it is narrower at the eyes, widening a little apically and basally. The eyes are also set closer to the clypeus and the antennae are shorter.

Pale yellowish, disk of head more testaceous; lateral stripe on head and nota as in *arborea*. Tegmina as in the latter, but the median stripe darker and more distinct.

Length: 5 mill.

Hab: Viti Isles (iii).

There are two or three other species from Cairns, etc., with different head structure but in imperfect condition for describing.

Heronax, gen. nov.

Allied to *Patara* Westwood* but the venation is different.

Head produced in front of eyes, vertex triangular, disk excavate, wider at base than an eye; there is no transverse carina dividing vertex from frons, but the latter is suddenly more shallow and the lateral keels are almost contiguous. Antennae articulated close to clypeus, second segment subcylindric, elongate, about three-fourths the length of the frons, not (or very slightly) sinuate apically. Scutellum with one (3?) obscure keel. Type *parnassius*.

1. *parnassius*, sp. nov.

Whitish testaceous, more or less sordidly infuscate. Tegmina with brownish spots on the costal cell, an irregular brownish

* The figure of the antenna of *Patara* in the Biologia Centrali Americana Hom. II (Pl. 9, f. 9 a) is obviously incorrect; Westwood says "Articulo primo annuliformi," as of course one would expect.

band across tegmina (not costal cell) medianly, and the veins (at least partly) widely infuscate. Tibiae annulated with blackish brown.

· Disk of vertex deeply excavated, lateral margins narrowly flat. Apical of the eyes the frons widens out triangularly but is not so wide apically as the base of the ecarinate clypeus.

Length: $3\frac{1}{4}$ mill to apex of abdomen, 7 to apex of tegmen.

Hab: Queensland, Kuranda (viii) on trees.

2. *saccharivora*, sp. nov.

Allied to the type but the apical veins are mostly sanguineous, and the tegminal pattern is pale, and more broken. Lateral margins of frons contiguous throughout, and dorsally the head is much narrower and but narrowly excavated.

Length as in the type.

Hab: Queensland, Cairns (vii-viii) on *Saccharum officinale*.

Philadelpheia, gen. nov.

Distinguished by the big, wide eyes which extend laterally beyond the pronotum. Of the general appearance of *Zoraida* Kirkaldy.

Scutellum roundly declivous, head roundly perpendicular. Vertex and frons confused, consisting of a strongly elevated keel on each side and a very narrow area between, narrowing still more anteriorly. Eyes very large, very transverse, extending laterally slightly beyond lateral margins of pronotum. Antennae with second segment short, subglobular, a little wider apically than at base. Clypeus longer than the epicranium, strongly keeled medianly, more lightly sublaterally. Rostrum extending beyond posterior coxae. Scutellum tricarinate. Tegmina very elongate, venation dissimilar to any other genus. Posterior tibiae with one small spine, a little apical of the middle.

1. *pandani*, sp. nov. (Pl. XXI, fig. 3, and XXIX, figs. 8-9).

Head, median keel of clypeus, pronotum, keels of scutellum, disk of metanotum, legs, etc., whitish. A large lateral wedge on pronotum, interior half of eye, clypeus, etc., vermilion. Scutellum and metanotum (except as above) orange. Tegmina and wings pale brownish, hyaline, costal cell broadly pallid, clavus and base of corium more or less smoky, veins dark brown, the

short transverse veins and exterior part sometimes of the others, broadly infuscate. Abdomen sordid testaceous, more or less marked with brownish.

Length: $3\frac{1}{2}$-4 mill to apex of abdomen; $9\frac{1}{2}$ to apex of tegmina.

Hab: Queensland, Cairns (viii) on *Pandanus.*

Sardis, gen. nov.

Allied to *Phenice* Westwood, but the tegmina are narrower basally, more elongate, and dilated apical to the clavus, head differently formed etc.

Scutellum strongly roundly declivous, pronotum vertical and head strongly bent under. Vertex short, separated by a smooth, confused line from the frons (of which the lateral margins are subcontiguous,) produced triangularly a little anteriorly, at base narrower than one of the transverse eyes. Antennae articulated close to exterolateral margin of genae and close to clypeus, which is as long as the epicranium and heavily carinate laterally. Pronotum deeply rectangularly emarginate. Scutellum strongly keeled in the middle.

1. *maculosa*, (Krueger). (Pl. XXVIII, figs. 4-6).

Phenice maculosa Krueger (?1897) Ber. Veruchsst. Zuckerr. West Java II, 243; and 1899 Das Zuckerrohr und seine Kultur 313; Zehnter 1897 Arch. Java Suikerind V. p. ? (Sep. 25).

Hab: Queensland, Cairns (viii), on *Saccharum officinale* and *Pandanus.* Originally recorded from Java.

Kruger (whose original work I have not seen) attributes it to Westwood, but I cannot trace any description by the latter.

Kaha, gen. nov.

Head produced more than their length in front of the eyes; vertex of frons somewhat confused, the former excavated as far as anterior margin of eyes, lateral margins acute and converging, meeting at anterior margin of eyes, continuing thence (somewhat nutantly) practically contiguous, as far as clypeus. Antennae large but short, with enormous sensory organs, giving the antennae a coralloid appearance. Pronotum carinate medianly, rectangularly emarginate, laterally subfoliaceous.

1. *perfecta*, sp. nov.

Testaceous, more or less infuscate; pronotum and scutellum pàle castaneous, polished. Underside more or less sordid testaceous, abdomen blackish, posterior-margin of each segment pallid. Tegmina hyaline, more or less infuscate, costal cell apically chequered sanguineous and white; veins on apical half of tegmina sanguineous.

Lenth: 5 mill.

Hab: Queensland, Cairns (viii).

Levu, gen. nov.

Apparently related closely to *Paricana* Walker as figured in J. Linn. Soc. Zool. I, Pl. 8, fig. 1 (which however has apparently no connection with the generic description), but the apical veins are not forked close to the margin, etc.

Vertex and frons confused, extending well in front of the eyes disk greatly depressed, very narrow, long triangular, lateral margins acute and converging, meeting close to anterior margin of eyes, contiguous till past the eyes and then widening a little apically. Clypeus basally depressed. Eyes prominent, much wider than vertex. Pronotum deeply rectangularly emarginate. Tegmina narrow, elongate.

1. *vitiensis*, sp. nov.

Stramineous, eyes black. Tegmina milky white, subopaque, apical veins pale yellow, apical margin subsanguineous.

Length: 4½ mill.

Hab: Viti Isles (iii).

Pyrrhoneura, gen. nov.

Vertex and frons confused, extending anteriorly before eyes, disk concave. Lateral margins acute, vertically elevated, dorsally they are thickly sensorized and converge straightly, not quite meeting anteriorly, posteriorly a little emarginate; ventrally they are elongate, narrow, a little wider apically. Antennae small, not articulated near clypeus. Ocelli present. Pronotum deeply angularly emarginate. Scutellum tricarinate.

1. *saccharicida*, sp. nov.

Vertex and frons yellowish testaceous, more or less suffused with sanguineous. Antennae clypeus and legs pale testaceous. Pronotum and scutellum sordid ferrugineous, laterally more or less suffused with sanguineous. Tegmina dark smoky, basally darkening more a large irregular blotch on the middle internally, the basal half of costal cell and 2 spots apical of this, 2 large spots on apical section, etc., white. Nearly all the veins bright sanguineous. Wings white with a large black spot almost covering apical half. Sternites blackish brown, posterior margin of each segment narrowly sanguineous.

Length: 3¼ mill to apex of abdomen, 5 to apex of tegmina.

Hab: Viti Isles, Rarawai Mills (iii), on *Saccharum officinale*. (Koebele's No. 2375.)

Rhotana, Walker.

Rhotana Walker 1857 J. Proc. Linn. Soc. London I, 160 (description only); Melichar 1903 Hom. Ceylon 61.

Genestia Stal 1858 O. V. A. F. XV, 450.

Walker's figure of the type (Pl. 8, fig. 2) has nothing to do with his description. Melichar has figured *R. vitriceps* (Stal.)

1. *chrysonoe*, sp. nov.

Differs from the three Sinhalese species and probably from the Bornean (from which it differs abundantly otherwise) by the short head which does not extend half the length of an eye beyond anterior margin of eyes. Pale luteous (metanotum and base of abdomen sanguineous in fresh example), rostrum, sterna, legs etc., paler. Tegmina and wings hyaline, iridescent; veins testaceous, faintly infumate broadly on each side of most of the transverse veins of the tegmina. Four tiny black specks on the radial vein. The subapical line is a little more irregular than in *R. vitriceps.*

Length: 2½ mill to apex of abdomen, 4½-4¾ to apex of tegmina.

Hab: Queensland, Kuranda (viii), arboreal.

2. *haematoneura*, sp. nov.

Ventral part of frons, smaller and narrower, less elevated laterally, etc.

Pale yellowish testaceous, scutellum more or less infuscate basally. Tegmina hyaline, largely clouded with brownish, veins sanguineous. Tergites infuscate.

Length: 5 mill.

Hab: Queensland, Kuranda (viii), arboreal.

Fam. Issidae.

There are two main divisions, characterized by the lateral form of the frons; this is however really not a sharp differentiation, *Gedrosia* Stal seeming to connect them. The Issinae have the lateral margins of the frons straight, or more or less rounded, while the Eurybrachyinae have them strongly, often acutely angulate. The former, moreover, are usually dull in hue, while the latter often have richly variegated tegmina and sometimes brightly colored wings. The aberrant genera *Tetigometra* Latreille and *Hilda* Kirkaldy should perhaps not be included in this family.

Subfamily Issinae.

Of this group some 60 genera have been erected, though many are still little known. It is not represented in the Hawaiian archipelago, but for Australia I record 6 genera and 13 species, of which 5 and 11 respectively are new. The Australian genera may be separated as follows:

1. Tegmina abbreviated, clavus not sutured off from corium (posterior tibia with one spine)......6 *Gelastissus* gen. nov.

1a. Tegmina complete, clavus sutured off..................2.

2. Tibiae with one spine; (tegmina tectiform).............
..................................5 *Lipocallia* gen. nov.

2a. Tibiae with 2 spines...................................3.

3. Wings rudimentary. ....4.

3a. Wings complete, not incised apically...................5.

4. Vertex flattish; cubital vein simple, median and radial veins forked near the base......4 *Hysteropterum* Am. Serv.

4a. Vertex concave; radial vein forked near the base, cubital and median veins forked the middle of the tegmina; (first segment of posterior tarsi very short)......3 *Sarnus* Stla.

5. Abdomen cylindrical; appearance Poekillopteroid.......
....2 *Lollius* Stal.

5a. Abdomen depressed; appearance Cercopoid..1 *Issus* Fabr.

Issus Fabricius.

Issus Fabricius 1803 Syst. Rhyng., 99; Melichar 1896 Cic. Mittel-Eur. 40, Pl. III, figs. 22-5.

The following three species very probably will not be referred ultimately to the genus *Issus*, as the frons and clypeus do not altogether lie in the same plane. They cannot be *Ulixes* Stal, as in that genus the scutellum is said to be twice as long as the pronotum.

1. *vulturnus*, sp. nov.

Vertex, pronotum and scutellum testaceous of various degrees of sordidness; frons and clypeus sordid brown. Tegmina dirty brownish, a transverse band (a little basal of the middle), the commissure, etc., dirty whitish. Legs dirty brownish, paler in places. Beneath sordid. Wings dark smoky. Vertex slightly transverse (apical margin very obtusely angulate), narrower than an eye. Frons with a round sublateral carina, and also a median longitudinal one, both slight but noticeable; postero-lateral angles rounded, posterior margin roundly emarginate; outside the round carina are small granules. Eyes, in profile, occupying nearly the whole of the head as far as the antennae. Pronotum granulate, medianly carinate. Tegmina about 3 times as wide (max.) as head and eyes together; veins strong, with numerous strong transverse veinlets (including costa and clavus). Cubital and median veins forked at about the middle.

Male: Pygofers black, polished, short, acute.

Length: 6 mill., maximum width 3 mill.

Hab: Queensland, Brisbane (vi), arboreal.

2. *sidnicus*, sp. nov.

Allied to the previous species, but smaller. The colorings and picturation are practically the same except that within the round carina of the frons, the color is castaneous, suffused with blackish on the disk, and there is a short, transverse, whitish stripe in the middle. Vertex about as wide as an eye, a trifle more transverse than in *vulturnus*; scutellum scarcely longer than the pronotum. Frons longer than wide, more swollen medianly and more granulate outside the round carina, lateral margins less divergent. Cubital vein forked a little nearer the apex than the median.

Male: Pygofers similar to the previous.

Length: 5¼ mill.

Hab: New South Wales, Sydney (i), arboreal.

3. *ridicularius*, sp. nov. (Pl. XXXI, f. 4).

Somewhat allied to *T. sidnicus*, but scarcely congeneric. Sordid testaceous, base of frons, apex of clypeus etc. dark. Abdomen, legs, etc., more or less obscurely and sparsely marked with brownish within the reticulations, exterior veins more or less greenish, or blackish. Vertex and eyes rather flatter and a little wider. Head and eyes as wide as, or a trifle wider than, the pronotum; costal margin more evenly rounded. Frons flatter, lateral keels straight, posterior keel obsolescent. Pronotum not granulate. Median and cubital veins forked at about the same place.

Male: Pygofers as in the previous species.

Female: Last segment almost linear, pygofers pale brownish, short, broad, the two together almost equilateral.

Length: About 6 mill.

Hab: Queensland, Cairns (viii), Bundaberg (ix-xii), arboreal. The Bundaberg specimen is the type.

4. *elongatulus*, sp. nov.

Scarcely congeneric with the three preceding.

Pale greyish cinereous, vertex and pronotum a little marked or suffused with green. Veins pale olive brown. Elongate, narrower; head, pronotum and scutellum not, or scarcely, granulate. Anterior margin of vertex truncately carinate, anterior to this (dorsally) is visible a small, rounded, part of the frons. Frons a little wider posteriorly than anteriorly, furnished with a circular carina and a medio-longitudinal straight one; posterolateral frontal angles rounded. Tegmina narrow, elongate, not so reticulate as in the preceding species, costa little widened, the radial vein forks almost immediately after its inception, the outer branch sinuate; the median vein forks apical of the middle, outer branch reforking; the cubital forks about the middle.

Length: $5\frac{1}{2}$-6 mill., width 2-$2\frac{1}{3}$ mill.

Hab: Queensland, Cairns (viii), arboreal.

Lollius Stal.

Lollius Stal 1866 Hem. Afr. IV, p. 209; and 1870 O. V. A. F., p. 763.

Stal states that the pronotum ("thorax" as he invariably terms it) is truncate; in the two species described, it is widely rounded.

1. *australicus*, Stal.

Lollius australicus Stal 1870, O. V. A. F., 763.
Hab: Queensland, Moreton Bay.
Unknown to me.

2. *angustifrons*, sp. nov.

Distinguished from *L. australicus* by the elongate frons; (in that species it is "almost as wide as long.") Greyish testaceous, vertex, lateral margins of frons (spotted with testaceous), markings on clypeus, etc., middle part of pronotum and of scutellum, extreme base of clavus, some obscure, small, markings on tegmina (especially on apical and costal margins), some more or less obscure markings on legs and abdomen—blackish. Underside yellowish testaceous, frontal carinae pale ferruginous. Tegminal veins more or less closely speckled with sanguineous. Wings pale smoky. Vertex a little longer than wide; lateral margins of vertex and frons acutely elevated vertically; on the front within these are 3 carinae united basally acutangularly, diverging a little posteriorly and roundly uniting again. Frons nearly twice as long as wide, wider posteriorly than anteriorly. Rostrum reaching to posterior coxae. Upper apical angle of tegmina about right angled.

Length: 8 mill., height in profile about $4\frac{1}{2}$ mill.
Hab: Queensland, Bundaberg (xi), arboreal.

3. *acutipennis*, sp. nov.

Closely allied to *L. angustifrons*, but smaller, and the upper apical angle of tegmina distinctly acute and more prominent; the anterior carina of vertex truncate, and more pronounced (it is feeble and excavately angulate in *L. angustifrons*). The veins are not, or very scarcely, marked with sanguineous.

Length: $5\frac{1}{3}$ mill., height $3\frac{7}{8}$ mill.
Hab: Queensland, Kuranda (Type viii), Nelson (vi), arboreal.

Hysteropterum, Am. Serv.

Hysteropterum Amyot & Serville, 1843, Hemipteres, 519.
1. *H. dorsale* Walker, 1851, List. Hom., 375.
2. *H. truncatellum* Walker op. c., 377.

Unknown to me; as Stal does not mention them, I presume they are rightly placed in the above genus.

Sarnus Stal.

Sarnus Stal., 1886, Hem. Afr., IV, 204.

The type is stated by Stal (Berlin. Ent. Zeit., X, 392) to be *Issus decipiens* Spin., a species the description of which is unknown to me. One specimen was collected, which I refer to this genus.

1. *lucindae*, sp. nov.

Head pale ferruginous, somewhat obscurely speckled and granulate with pale yellowish; pronotum and scutellum sordid brownish, anterior two-thirds of latter pale yellowish brown. Tergites more or less black, genital segments pale, sternites sordid brownish. Tegmina pale cinereous, veins brownish, a brownish smudge across middle and a brownish spot on costal margin near apex. Legs pale, strongly and widely annulate with black. Vertex transverse, a little wider than an eye, anteriorly widely obtuseangled, posteriorly widely obtuse angularly emarginate. Frons flat, with an obscure circular keel, granulate between this and the base. Pronotum granulate, scutellum little longer than the pronotum, smooth, with a deep puncture on each side. Tegmina narrow, elongate, subcoriaceous, costal margin close to base, then widened roundingly; veins strong.

Length: $3\frac{1}{3}$ mill.

Hab: Queensland, Lucinda Point (vii), probably arboreal,

Lipocallia, gen. nov.

Allied to *Neocethus* Stal but the tegmina are subcoriaceous, lateral carinae of the frons are as well developed as the median, the costal area is reticulate, etc.

Vertex transverse, almost linear, truncate apically. Frons quadrangular, perpendicular; lateral margins slightly sinuate, narrowing a little just basal of the clypeus, with 2 lateral curved carinae (forming an oval) and a longitudinal median one, all of equal strength. Pronotum very transverse, slightly arched anteriorly, slightly roundedly emarginate posteriorly, medianly carinate longitudinally. Scutellum nearly 3 times as long as pronotum. Tegmina tectiform, covering body completely. Corium more or less convex, costal area dilated, a little sinuate,

Tegmina closely reticulate, more minutely costally, apical margin roundly obliquely truncate.

1. *australensis*, sp. nov.

Head, pronotum, etc., testaceous, very closely and finely mottled with dark brown. Tegmina whitish testaceous, many of the recticulations wholly or partly brownish. Legs mostly blackish brown. Tergites black and white alternately. Genital segments black.

Length: $3\frac{1}{2}$ mill., height $2\frac{1}{4}$ mill.

Hab: New South Wales, Sydney (i-ii), arboreal.

There is sometimes a more or less obscure blackish band across the middle of the tegmina.

Gelastissus, gen. nov.

Somewhat allied to *Peltonotellus* Puton. Vertex flat or slightly concave, posteriorly truncate. Eyes very large, extending practically as far as the base of the pronotum. Frons at about right angles to the vertex, narrow, elongate, strongly and elevately carinate medianly with a lateral keel on each side, and a more or less obscure, sometimes obsolescent, curved keel on each side between the others, forming an elongate oval. Pronotum transverse, anterior and posterior margin truncate, medianly carinate, also a carina on each side close to the eye. Scutellum about twice as long as pronotum, tricarinate. Tegmina strongly abbreviate, venation obscure, clavus not sutured off, radial, cubital and brachial veins apparently all joined close to base. Legs simple. Type *albolineatus*.

The three Australian species are easily separable as follows: (It is possible that 2 and 3 are not congeneric with the first):

1. Blackish brown, with an entire, white longitudinal line. .... 1 *albolineatus*.
1a. Tergites apically sanguineous.......................... 2.
2. Tegmina opaque, blackish.................. 2 *histrionicus*.
2a. Tegmina translucent, pallid.................... 3 *suffusus*.

1. *albolineatus*, sp. nov. (Pl. XXIX figs. 1-2.)

Blackish, more or less shining; a white longitudinal stripe from apex of vertex to apex of abdomen and a lateral stripe of same color from apex of propleura to apex of abdomen. Genae,

clypeus laterally, legs, abdomen partly, pale testaceous.

Vertex flat, twice as long as pronotum, obtusangulate and a little prominent apically. Tegmina opaque, reaching to about one-half of the length from base of pronotum to apex of abdomen.

Length: 3¼ mill.

Hab: Queensland, Cairns (vii-viii), Koebele's No. 2257 from grasses on damp ground.

2. *histrionicus*, sp. nov.

Vertex, pronotum and scutellum brownish piceous; frons, carina of clypeus, tegmina etc., shining black; sides of clypeus, genae, underside more or less, legs, etc., testaceous. Tergites mostly testaceous, 3 apical segments pale sanguineous.

Smaller and more elongate than *G. albolineatus*, vertex more concave, shorter, scarcely longer than pronotum, not produced in front of eyes, apically subtruncate. Tegmina opaque, more rounded costally, reaching to about two-thirds of the length from base of pronotum to apex of abdomen.

Length: 2½ mill.

Hab: Queensland, Cairns (viii, No. 2272), from grasses on dry ground.

3. *suffusus*, sp. nov.

Closely allied to *G. histrionicus* but I do not think it is an immaturely coloured form of that species.

Pale testaceous; vertex, pronotum and scutellum more or less suffused with pale sanguineous. Tegmina shining, translucent. Tergites pale yellow testaceous, base and 3 apical segments pale sanguineous.

Length: 2½ mill.

Hab: Queensland, Cairns (viii), probably on grasses.

N. B.—I do not possess the description of the following species, but suppose that it belongs to the Issinae:

1. *Alleloplasis darwini* G. B. Waterhouse 1839 T. E. S. London II.

Subfam. Eurybrachyinae.

Of this group some 20 genera have been proposed; they are unknown in Hawaii, but 7 genera and 25 species are recorded from Australia, of these 3 and 5 respectively are now described as new.

The Australian genera may be separated as follows: They all belong to the sub-group with closed clavus:

1. Antennae reaching plainly beyond eyes................2.
1a. Antennae not reaching as far..........................3.
2. Frons transverse, angulate laterally.......4. *Dardus* Stal.
2a. Frons scarcely wider than long, roundly ampliate on each side ....1. *Gedrosia* Stal.
3 Pronotum and scutellum together about as wide as long ....2. *Platybrachys* Stal.
3a. Pronotum and scutellum together, wider than long......4.
4. Frons strongly carinate and excavate.................. ....6. *Gelastopsis*, gen. nov.
4a. Frons flat or only slightly rugose; lightly carinate.......5.
5. Tegmina elongate, narrow....5. *Euronotobrachys*, gen. nov.
5a. Tegmina shorter, broader.................3. *Olonia* Stal.

The Australian Eurybrachyini are probably all *Eucalyptus*-feeders; *Euronotobrachys arcuata* was found always in grass, but it had probably been blown or fallen from *Eucalyptus*.

Gedrosia Stal.

Gedrosia Stal 1862 O. V. A. F. XIX 448.

1. *Eurybrachys varia* Walker 1851, List. Hom. 394.

Unknown to me.

Platybrachys Stal.

Platybrachys Stal 1859 Eugenie's Resa. Ins. 280, and 1861 K. Vet. Ak. Handl. 3 No. 6, p. 67 and 1862, O. V. A. F. XIX 448.

A large number of Australian species have been described, none of which however have I been able to identify. In the first work cited, Stal figures the type, but the structure of the head and of the clavus are not like any Australian forms I have seen; in the second work the genus is included among the forms with open apex to clavus; in the third (one year later) among those with closed apex! In the forms about to be described the clavus is closed, but is not acute. The genus is badly in need of revision.

1. *oculata*, sp. nov.

Head testaceous, sometimes tinged with olive brown; pronotum and scutellum sordid castaneous, abdomen mostly black; anterior and intermediate legs castaneous, except the black,

foliaceous part of the anterior tibiae; posterior legs black. Tegmina reddish castaneous, apical margin narrowly smoky, a small black spot near the apex, with three tiny white specks enclosed, and a narrow testaceous line from this spot to costal margin, (or there may be two or three black spots, each encircling white specks, or there may be no white specks; apical margin often more broadly dark.) Wings dark smoky. Vertex rather less than twice as broad as long.

Length: 11-12½ mill.

Hab: Queensland, Cairns (viii), Nelson (vii), Brisbane (vi).

2. *chlorocephala*, sp. nov.

Similar to *P. oculata* but head pale bright green, an additional black spot on tegmina, about middle of costa; posterior legs sordid brownish. Vertex more than three times as wide as long.

Length: 12 mill.

Nab: New South Wales, Sydney (ii).

3.. *sicca*, (Walker).

Eurybrachys sicca Walker, 1851, List. Hom., 384.

E. rubiginea Walker op. c., 386.

E. semisicca Walker op. c., 387.

An example from Queensland, Cairns (viii) and some from Bundaberg (xi) seem to be var. *rubiginea*, but Walker's descriptions are too unsatisfactory for certain determination. It is probably not congeneric with *P. oculatus*.

The following species have been described from Australia:

4. *Eurybrachys decemmacula* Walker, 1851, List., 389.
   (=*Aphana lanifera* Stal., 1854, O. V. A. F., 244, type of genus, figured in Eugenie's Resa. Ins. Pl. IV, f. 8).
   Hab: New South Wales, Sydney.
5. *E. maculipennis*, LeGuillou, 1841, Rev. Zool. 261.
   (The description is unknown to me.)
6. *E. sera* Walker List., 385=*semilimpida* Walker, 387.
   Queensland (?), Port Essington.
7. *E. leucostigma* Walker, 388.
8. *E. decisa* Walker, 389.
9. *E. sanguiflua* Walker, 1858, suppl. 330.
10. *P. signata*, Distant, 1892, Tr. E. S., London, 281.
11. *P. insignis*, Distant, op. c. 282.

12. *P. aerata*, Distant, op. c. (Also from Samoa).
13. *P. lugubris* Stal, 1863, Stett. Ent. Zeit., XXIV, 249. Queensland, Moreton Bay.
14. *P. vidua* Stal l. c., (same locality).
15. *P. aegrota* Stal op. c., 250.

Olonia Stal.

Olonia Stal., 1862, O. V. A. F., 488.

1. *picea*, sp. nov.

Distinguished from *O. rubicunda* Stal. by the shorter vertex; from *O. transversa*, by the absence of conspicuous markings on head and pronotum and by the different coloring of tegmina; from *O. apicalis*, by the absence of curved furrow and row of impressions on vertex, etc.

Piceous; sterna, abdomen and basal half of posterior femora, sanguineous. Tegmina piceous, the disk ferruginous more or less darkened in places, a short white stripe near the apex (sometimes obsolescent). Wings dark smoky.

Vertex and eyes a trifle wider than pronotum, the first named about four times as wide as long; frons irregularly longitudinally rugulose.

Male: Genital segment dark.

Female: Genital segment pale; a large white spot on costa, anteriorly.

Length: (male) 7-7¼; (female) 7½-8 mill.

Hab: Queensland, Cairns (vii-viii).

The following three species have been described from Australia:

2. *Eurybrachys rubicunda* Walker, 1851, List. Hom., 391; Queensland, Sandy Cape.
3. *E. apicalis* Walker, op. c., 393; Northwest Coast.
4. *E. transversa* Walker, 1858, Suppl., 96; Queensland, Moreton Bay.
5. *O. viridiventris* Stal 1863 Stett. E. Zeit., XXIV, 250; Queensland, Moreton Bay.

Dardus Stal.

Dardus Stal., 1859, Eugenie's Resa Ins., 279; and 1861, K. Vet. A. K. Handl. 3, No. 6; 67 and 1862, O. V. A. F., 488.

1. *immaculatus*, sp. nov.

Piceous, immaculate. Carinae on head, pronotum, etc., and veins (mostly) dark castaneous. Pleura, abdomen and posterior femora sanguineous; rest of legs obscurely marked with pale brown.

Lateral angles of frons much more produced than in Stal's figure of *D. abbreviata*.

Length: $5\frac{7}{8}$ mill.

Hab: Queensland, Brisbane (vi).

2. *abbreviata* (Guerin).

Eurybrachys abbreviata Guerin, 1838, Voy. Coquille, 190.

E. lacta White, Eyre's Expd. Austral. Appendix, 433, Pl. 4, f. 3.

E. rufiventris Stal., 1858, O. V. A. F., 191. (Figured in Eugenie's Resa. Ins., Pl. IV, f. 7.)

Hab: New South Wales, Sydney (ii).

The curious nymph is figured on Pl. XXIX fig. 5.

The following species have also been described:

3. *Eurybrachys bufo* Walker, 1851, List. Hom., 393.
4. *Dardus albomaculatus* Distant, 1892 Trans. Ent. Soc. London 282.
5. *D. obscurus* Distant, op. c. 283.

Euronotobrachys, gen. nov.

Allied to *Olonia* Stal. Somewhat of the form of *Nicidus* Stal, but the tegmina and wings are shorter and the clavus is apically acuminate and closed, the wings are also broader basally. Antennae short. Scutellum with three carinae. Anterior tibiae with three spines. Type *E. arcuata*.

The two species are separable thus:

1. Vertex a little more than twice as long as wide;
   Length: 8 mill........................1 *arcuata* sp. nov.
2. Vertex more than three times as long as wide;
   Length: $10\frac{1}{2}$ mill........................2 *plana* sp. nov.

1. *arcuata*, sp. nov.

Pale yellowish ferruginous, marked with blackish brown, the frons freckled with dirty brown. Sterna and abdomen sangu-

ineous. Tegmina pale ferruginous, irregularly and sordidly spotted with blackish brown, especially apically; costa near apical angle and the apical margin (except extreme) hyaline a pale yellowish transverse band near base. Wings dark smoky. Legs black, obscurely and sparsely marked with yellowish brown.

Vertex a little more than twice as long as wide, longitudinally striate, roundly arched anteriorly. Face wider than long, acutangulate laterally, a transverse round-oval carina on the disk. Tegmina postero-apically almost rectangular, posterior angle extending further out than the rounded anteroapical angle.

Length: 8 mill.

Hab: Queensland, Cairns (vii-viii).

2. *plana*, sp. nov.

Ferruginous, irrorated with black, a black blotch on the middle of the clavus; tegmina irregularly and undulatingly striped narrowly longitudinally, etc., with black, a hyaline transverse line near apex; veins mostly ferruginous. Face and legs black, the former minutely and obscurely marked with testaceous, the latter with ferruginous. Sterna and abdomen sanguineous.

Larger than the preceding, the vertex wider (more than three times as wide as long) and less arched. Frons not so angular laterally, about as wide as long, with a rounded carina. Tegmina rounded apically.

Length: $10\frac{1}{2}$ mill.

Hab: Queensland (viii).

Gelastopsis, gen. nov.

Of the general form of *Euronotobrachys* but with a very different frontal structure and longer antennae; allied to *Dardus* but with different frontal and tegminal form.

Dorsal part of head a little irregularly arched anteriorly, below this a sinuately arched carina; the space thus enclosed about three times as wide as long. Head and eyes a little wider than pronotum. Frons transverse, much wider than long; lateral angles roundly acute. It is divided transversely into two areas of different color and texture—the anterior area has a large rounded carina and a straight median one, all these being thickened and deepened, the depths being longitudinally striate. The anterior margin of the posterior area is boldly sinuate; sub-

laterally the disk is transversely carinate. Pronotum broader than length of pronotum and scutellum, the latter tri-carinate. Costa strongly arched basally, the rest of the tegmina being parallel sided, upper apical angle rounded, not extending quite so far as the subrectangular lower apical angle. Anterior and intermediate tibiae and tarsi dilated, posterior tibiae trispinose.

1. *insignis*, sp. nov.

Vertex, pronotum and scutellum yellowish brown, marked with brownish black; anterior area of frons black, posterior area yellowish, variegated with brownish. Clypeus reddish variegated with yellowish. Meso and metasterna and abdomen sanguineous, the last named more or less black dorsally. Tegmina ferruginous, costally and apically blackish; a line near base of corium, another close to anterior margin of tegmina and a shorter one on costa a little basal of the last named, pale yellowish; also various more or less obscure yellowish spots. Veins ferruginous, apically more or less blackish. Wings dark smoky black. Anterior and intermediate legs blackish brown, variegated with ferruginous; posterior femora sanguineous; tibiae ferruginous.

Length: 8½-9 mill.

Hab: Queensland, Brisbane (vi).

The following is unknown to me:

1. *Lyncilia nobilis* Stal 1863, Stett. Ent. Zeit., XXIV 248. Lizard Island.

Fam. Poekillopteridae.

This family consists of three subfamilies separable as follows:

1. Clavus granulate; posterior tibiae with one to three spines. ....3 *Poekillopterinae*.
1a. Clavus not granulate.............................2.
2. Posterior tibiae with 2 to 4 spines...........1 *Ricaniinae*.
2a. Posterior tibiae spineless................2 *Amphiscepinae*.

Subfamily Ricaniinae.

Very little material in this group was collected; it is not known in Hawaii, but 11 genera and 18 species are recorded from Australia, one new species being now described. The group has been monographed recently by Melichar

Euricania Melichar.

Euricania Melichar 1898 Ann. Mus. Wien. XIII, 204 and 258.
A genus of 11 species from New Guinea and adjacent islands, Viti, China, Japan and India.

1. *tristicula* (Stal).

Ricania tristicula Stal, 1865, O. V. A. F., XX, 163.
Euricania tristicula Melichar, op. cit. supra 265, Pl. XI, figs. 7 and 20 and Pl. XIII, f. 14.

Privesa Stal.

Privesa Stal, 1861 K. Vet. Ak. Handl. 3 No. 6, p. 70 Melichar 1898, op. c. supra 282.
A widely distributed palaeotropical genus of 9 species.

1. *aphrophoroides* (Walker).

Dechitus aphrophoroides Walker 1862 J. Ent. 1, 311 *Pl. XV, f. 7.*
Hab: Queensland, Moreton Bay (Walker); Bundaberg (ix-xii), Brisbane (vi and xi).
Exceedingly common.
Another species has been recorded from Australia, viz.: *P. exuta* Melichar, p. 284, Pl. XII, f. 4 and Pl. XIII, f. 9, from Queensland, Cape York, Moreton Bay and Gayndah (not Gayndak as Melichar quotes).

Scolypopa Stal.

Scolypopa Stal, 1859 Berlin, Ent. Zeit. III, 325: Melichar, p. 278.
An Australian, Oceanian and Madagascan genus. Melichar (p. 278) says: "Apicalrand nur halb so lang wie die Sutura Clavi." In this he is obviously wrong and has more correctly expressed it on page 205 "Kaum laenger."

1. *australis* (Walker). (Pl. XXI, f. 1).

Pochazia australis Walker, 1851 List. 430; Froggatt 1900 Agr. Gaz. N. S. W., XI, 650; Pl. (no number), fig. 6; T. W. Kirk,

1903, Eleventh Rep. Agr., New Zealand, 437; text-figs. 1-4.

Scolypopa australis Melichar, p. 278, Pl. XI, f. 24.

Hab: Queensland, Bundaberg (ix-xii); Moreton Bay (Melichar); New South Wales, Sydney (i); New Zealand, Palmerston North (my collection), etc.; Viti (Froggatt).

Commonly distributed on several plants, especially "Passion fruit vines" and ferns; it is somewhat of a pest.

2. *kurandae*, sp. nov.

Not very closely allied to any other species.

Brown; eyes pale reddish striped narrowly sub-concentrically with violet brown. Mesonotum blackish, carinae red brown. Beneath pale yellowish. Tegmina dark brown, a few of the nervures paler; one or two short, more or less obscure, darker transverse fasciae, a whitish triangular spot on the costal membrane; costal membrane and apical margin blackish.

Frons with five distinct carinae, the sublateral keels being much more distinct than in *A. australis*. Rostrum short, scarcely reaching to intermediate coxae.

Length: 8 mill.

Hab: Queensland, Kuranda (viii); one example on a dwarf *Casuarina* in a rocky, wind-swept place on the banks of the Baron River.

3. *scutata* Stal.

S. scutata Stal. 1859, Berlin Ent. Zeit. III, 26; Melichar 280, Pl. XI, f. 28.

Unknown to me.

Gaetulia Stal.

Gaetulia Stal, 1864 Stett. Ent. Zeit. XXV, 54; Melichar 327.

Probably cosmo-tropical.

1. *chrysopoides* (Walker).

Ricania chrysopoides Walker, 1862, J. Ent. I, 312.

Allied to *G. nigrovenosa* Mel., but differing by the form of the vertex which is wider than long, and by the color. I have little doubt as to the correctness of the determination, though Walker describes the vertex as 'transverse quadrate'; it is, in fact, obtuseangulate anteriorly and correspondingly emarginate posteriorly.

Hab: New South Wales, Sydney (i).

Epithalamium, gen. nov.

Differs from *Armacia* Stal by the radial vein not being forked near the base.

The tegmina are broad, nearly as broad as long, and rounded apically; the radial vein is joined to a refurcation of the median by a slight, transverse vein, a little basal of the middle; apical of this the radial forks, the outer branch being joined almost immediately by a slight, transverse vein to the exterior subapical cell (which is curved and encroaches on the costal cell apically). The median vein forks at about a third the length of the tegmen. There is a fairly regular subapical line, and two very irregular transverse lines basal of this.

1. *aziola*, sp. nov.

Head, pronotum and scutellum pale ferruginous; underside and the legs paler. Tegmina hyaline, veins blackish brown, pale ferruginous and whitish; costal cell (the transverse veins pale), basal half and a spot at apex of subcostal, basal cell, clavus, a long spot about the middle of the tegmina, apical margni broadly (except a small hyaline spot at the apex of some of the cells), and a narrow oblique band nearer to the apex than the middle, broadening and darkening costally, more or less dark smoky. Wings hyaline, marginally smoky. Abdomen basally black.

Length: About 5½ mill.

Hab: New South Wales, Sydney. (Koebele's No. 2367).

Unfortunately only a single, stylopized, female of this pretty Ricaniine.

The following Ricaniinae are Australian:

Ricania Germar.

1. *confusa* Melichar 220 and 227; Queensland.

Ricanoptera Melichar.

1. *extensa* Mel., 254 and 255.
2. *patricia* Mel., 264 and 257. Queensland.
3. *prominula* Schmidt 1905 Stett. E. Zeit., LXVI 180, Queensland.

Plestia Stal.

1. *Ricania marginata* Montrouzier, 1861, Ann. S. E. France, (4) I, 73; figured by Melichar; Pl. XIII, f. 17 and Pl. XIV, f. 1; (also from *Viti* and *Lefu*).

Nogodina Stal.

The sutural angle is more acute in some examples than in others. The vertex is usually roundly angulate, sometimes it is distinctly angulate. It is to be noted that in examination, the insect must be kept horizontal, as the further the head is tilted, the more angulate the vertex becomes to the view.

Hab: Queensland, Bundaberg (xi); New South Wales, Sydney (i-ii); introduced into the Hawaiian Islands. Melichar records it, possibly in error, from Tasmania also.

3. *acutipennis*, sp. nov.

Closely allied to *S. acuta*, but the reticulations are less granulate, and different in form; the sutural angle more acute. Vertex more elongate and more truncate anteriorly, lateral margins more parallel. Disk of wings immaculate, except that sometimes there are one or two tiny red specks.

Length: 10½ mill.

Hab: Queensland, Cairns (vi), Nelson (vii).

4. *breviceps*, sp. nov.

Allied to *S. acutipennis*, but the vertex is shorter than the pronotum (or at least not longer) and rounded anteriorly. Bright grass green, granules of corium rather closer and more numerous than in *S. acuta*.

Length: 8½ mill.

Hab: Queensland, Bundaberg (vi).

5. *toga*, sp .nov.

Probably of same general form as *S. patruelis* Stal,* but the vertex is longer and the pattern different. Grass green, paler beneath; a yellow longitudinal oblique stripe on the tegmina. Apex of vertex, tibiae more or less sanguineous.

Vertex and pronotum about the same length, the first named forming a right angle anteriorly. Tegmina about three-fourth longer than wide, subparallel after the basal fourth, apical angles rounded, not prominent.

Length: 9-9½ mill.

Hab: Queensland, Cairns (vii), Nelson (vii), Bundaberg (vi). The yellowish stripe is sometimes more or less blended with

*Stal states Manila as habitat of *patruelis*; Melichar, who seems to have examined the type, says 'Java'.

the ground color of the tegmina. This species is strongly granulate all over head pronotum, scutellum, clavus, etc., with scattered ones on corium; the taller are reddish brown, those on the clavus blackish brown.

6. *lucindae*, sp. nov.

Size and form of *Sephena cinerea*; apparently close to *S. granulicollis* (Stal.) but larger and the color different; vertex anteriorly angulate. Orange yellow, paler beneath; head more or less suffused with sanguineous; commissure and apical margin sanguineous, the latter chequered with the ground color; tegminal granulations black.

Vertex anteriorly obtusangulate, scarcely extending beyond the eyes, nearly twice as broad as long. Corium (excluding the margins) with about fifteen granulations.

Length: 6 mill.

Hab: Queensland, Lucinda Point (vii).

7. *granulicollis* (Stal.)

Poeciloptera granulicollis Stal, 1859, Eugenies Resa, Ins. 282.

Siphanta granulicollis Melichar, 38.

Like *S. lucindae* but narrower, colored differently. With twice as many granulations on the corium (excluding the margins).

Length: 5½-6½; (Melichar says 5, Stal 4!)

Hab: Queensland, Cairns (viii).

Melichar records also from Sydney.

8. *subgranulosa*, sp. nov.

Closely allied to *S. granulicollis*, but granulations as in *S. lucindae*.

Length: 6½-8 mill.

Hab: Queensland, Cairns (vii).

9. *granulata*, sp. nov.

Close to *S. lucindae*, but differently colored, and granulated as in *S. granulicollis*.

Pale brownish cinereous; head, pronotum and scutellum more or less suffused with sanguineous or orange; commissure and

apical margin of tegmina more or less sanguineous. Tegmina with a faint violet tinge; costa pallid.

Length: 6⅛ mill.

Hab: Queensland, Cairns (vii).

10. *rubra* Schmidt.

Siphanta rubra Schmidt, 1904, Stett. E. Zeit., 64, p. 358.

Hab: Queensland.

Unknown to me.

Euryphantia, gen. nov.

Vertex flat, laterally carinate, the keels extending fairly straight to a little above the eyes, then diverging, meeting apically in a rounded obtuse angle; with eyes narrower than the pronotum. Lateral margins of frons sinuate, widened out roundedly towards the apex with three internal carinae, the lateral two of these meeting (on a higher, as seen in profile, level than the exterolateral carinae) at the apex with the median carina in an acute angle, rounded exteriorly. Ocelli very distinct. Antennae very small, scarcely extending laterally to half the width of eye as seen from below. Clypeus not carinate. Vertex carinate medially, the keel extending through pronotum and mesonotum, the latter with sublateral keels which unite posteriorly, the median being obsolescent a trifle anterior to this. Pronotum granulate; tegmina elongate, subparallel, irregularly reticulate especially apically, apical margin obliquely subtruncate; apical angle rounded, extending a little further than the sutural angle. The cubital vein is the only one forked in the basal half of the tegmen, the forking taking place at about the basal third of the tegmen. There are a few veins in the clavus, but scarcely transverse. Costal cell about the same width throughout and open apically; thickly set with tiny granulations, as is also almost the whole of the tegmen, except the exterior claval area, and the two corial areas adjoining it. No regular subapical transverse line. Posterior tibiae with one spine.

1. *cinerascens*, sp. nov.

More or less cinereous, the mesonotum brownish. Tegmina subhyaline, pale cinereous, reticulations tinged with brownish. Granulations brownish. Ocelli red.

Length: 8¾ mill.

Hab: Queensland, Bundaberg (vi).

Sephena Melichar.

Sephena Mel., XVI, 197.

A genus of forms from Papua and neighboring islands.

1. *rubida*, sp. nov.

Vertex and frons dark purplish-brown, keels yellowish brown. Pronotum and scutellum yellowish brown, keels of the latter ferruginous. Tegmina pale rosy brown with mealy bloom, and some darker spots. Wings milky white, veins brownish black. Legs yellowish brown.

General form of *Paratella umbrimargo*.

Length: $7\frac{1}{2}$ mill.

Hab: New South Wales, Sydney (i-ii).

Although this and the following have the characters of *Sephena* assigned by Melichar, they have more the appearance of *Paratella*.

2. *hyacintha*, sp. nov.

Blackish, keels of head yellowish brown. Tegmina opaque, bluish black; costa more or less dirty yellowish. Legs yellowish brown.

Length: 7-9 mill.

Hab: Queensland, Cairns (vii-viii), Brisbane (vi).

3. *cinerea*, sp. nov.

Smaller and narrower than *S. rubida*, vertex narrower. Pale brownish cinereous, immaculate. Eyes reddish.

Length: $6\frac{1}{2}$ mill.

Hab: New South Wales, Sydney (i-ii).

4. *argus*, sp. nov.

Form and size of the preceding.

Head, pronotum and scutellum pitchy; keels of vertex ochraceous. Eyes reddish. Tegmina brownish with a faint violet tinge, spotted and granulate with violet brown.

Length: 7 mill.

Hab: Queensland, Cairns (viii).

Colgar Kirkaldy.

Colgar Kirkaldy, 1900, Entomologist. XXXIII 242.
Cromna Melichar, XVII, 59 (nec Walker).
A genus from Australia and the neighboring isles.

1. *peracuta* Melichar.

? *Cromna peracuta* Walker, 1858, List. Hom. Suppl., 120.
Cromna peracuta, Mel. 62.
Hab: Queensland, Bundaberg (vi), also recorded by Melichar from New South Wales and Aru Isle.

2. *frontalis* Melichar.

Cromna frontalis, Mel. 59.
Melichar records this from Queensland: Rockhampton (and Palmerston County—? Queensland or North South Australia).

Mimophantia Matsumura.

Mimophantia Mats., 1900, Ent. Nachr. XXVI, 212; Melichar, XVII, 17.
A single species has been described from Japan.

1. *australensis*, sp. nov.

A little smaller than *M. maritima*; the vertex is about one-half longer than pronotum, which is not so acute anterolaterally, and the points do not extend beyond the eyes laterally. Sutural angle not so acuminate. Sternites blackish brown; posterior margins pale.
Length: $4\frac{7}{8}$-5 mill.
Hab: Queensland, Cairns (vii-viii) on grass, Kuranda (viii), Bundaberg (ix-xii).

Aphanophantia, gen. nov.

In Melichar's tables, this runs down to *Gyaria* but differs by the frons being carinate, and not much longer than wide. Head and pronotum subporrect, not declivous as in *Gyaria*, vertex a little longer than pronotum, conical, rectangularly prominent anteriorly, truncate posteriorly. Pronotum roundly, widely

emarginate posteriorly, scutellum with a double keel medianly and a lateral one each side. Pronotum and scutellum feebly carinate. Tegmina subcoriaceous, little longer than wide, posteriorly roundly obliquely truncate; reticulate; costal cell generally broader than sub-costal cell, with many simple transverse veins. Wings rudimentary.

1. *cuscuticida*, sp. nov.

Pale testaceous or pale cinereous, tegmina a little smudged in places sometimes, with pale sordid brownish; nerves whitish. Abdomen blackish brown, posterior margins of segments pallid.

Length: 2-2½ mill.

Hab: New South Wales, Sydney (ii) on *Cuscuta* grass.

Massila Walker.

Massila Walker 1862, Journ. Ent. I, 314.

Allied to *Anidora* Mel., but with differently formed tegmina, etc.

Vertex very short, transverse, apically subtruncate, scarcely extending beyond the eyes. Frons vertical, laterally rounded, medianly carinate, width and length about equal, lateral keels strongly elevated. Clypeus set somewhat deeply into the frons, medianly carinate. Antennae very short. Ocelli distinct. Pronotum simple, wider than head and eyes, anteriorly truncate in the middle, posterior margin roundly excavate. Mesonotum longer than head and pronotum together. Tegmina elongate, more than twice as long as broad, irregularly reticulate; interior margin of clavus strongly arched, basal ⅔ of costal margin arched, the apical third straight and subparallel with opposite margin of tegmina, apical margin subtruncate; no subapical line. Costal cell narrow. Posterior tibiae with one spine. Type *sicca* Walker.

There are two species very closely allied.

1. Cubital clearly forked near the middle, subradial also clearly forked a little nearer the apex..........*sidnica*, sp. nov.

1a. Subradial indistinctly forked...........*walkeri*, sp. nov.

1. *walkeri*, sp. nov.

Agrees fairly well with the description of *M. sicca*, except that the transverse veins in the tegmina, specks in the reticulations,

claval granules (at least in part) are pale sanguineous; this is so conspicuous that Walker could hardly have had this species before him when describing *sicca*, unless he had alcoholic material.

Length: 7 mill.

Hab: Queensland, Brisbane (vi), Bundaberg (ix-xii).

2. *sidnica*, sp. nov.

Very close to the last but smaller and more reticulate. The characters in the key also seem to distinguish it.

Length: 6 mill.

Hab: New South Wales, Sydney (i-ii).

Of the two species previously described, *M. sicca* has already been referred to. *M. unicolor* Walker (1862 Journ. Ent. 1, 315) does not seem to belong to the genus.

Jamella, gen. nov.

Belongs to the Phalaenomorphini, but does not seem to be closely related to any other genus.

Vertex short, three to four times as wide as long, subtruncate anteriorly, carinate medianly. Eyes prominent. Frons a little longer than wide, at about right angles to the declivous pronotum, basal half carinate medianly. Second segment of antennae much wider apically than basally, obliquely truncate apically. Pronotum anteriorly truncate, narrower there than the vertex, anterior margin almost on a line with the anterior margin of the eyes, lateral margins highly sinuate, posterior margin subrotundately emarginate, somewhat obsolescently tricarinate. Scutellum with three keels, the lateral ones sinuate. Tegmina subhorizantal, overlapping apically. Costa a little arched near the base, costal rather wider than sub-costal cell; radial vein forked near the base, cubital forked a little nearer the apex; no subapical line. Tibiae with one spine.

1. *australiae*, sp. nov.

Testaceous; tegmina pale cinereo-testaceous, veins, crossveins and tiny specks in many of the cells pale brownish, sometimes with a reddish tinge.

Length: 9-9½ mill.

Hab: Queensland, Cairns (viii).

The following have also been recorded from Australia and Viti:

Aflata Mel.

1. *stali* Mel. p. 8, Pl. VII, fig. 3. *S. Australia.*

Microflata Mel.

1 *stictica* Mel. 10 Pl. V, fig. 2.

Euphanta Mel.

1. *acuminata* Mel. 39 *Viti*, Ovalau.
2. *ruficeps* Mel. 39.
3 *munda* (Walker) Mel. 39 *S. Australia.*
4. *luridicosta* Schmidt 1904 Stett. Ent. Zeit., 359. *Queensland.*
5. *rubromarginata* Schmidt, op. c., 360.

Paratella Mel.

1. *nivosa* (Walker) Mel. 121. *Queensland.*
2. *fusconigra* Mel. 121 "
3. *fumaria* Mel 122. *New South Wales.*
4. *modesta* Mel. 122. *Queensland.* (Also from New Zealand, probably a mistake.)

Dascalina Mel.

1. *aegrota* Mel. 155, Pl. VII, fig. 6. *Queensland.*
2. *reversa* Mel. 155, fig. 15. "
3. *alternans* Mel. 155, fig. 15. "
4. *contorta* Mel. 156, Pl. IX, fig. 8. "

Addendum.

The original manuscript containing the descriptions of the following forms having been lost, and therefore omitted in the proper place, these are now added:

Fam. Tetigoniidae.
Subfamily Iassinae.
Tribe *Cephalelini.*

Myrmecophryne, gen. nov.

This should probably be placed near *Graphocraerus*, Thompson; it has somewhat the appearance of *Xestocephalus*, Van Duzee.

Oval. Vertex transverse, declivous; rounded in front, as viewed dorsally (eyes forming part of the curve), but actually slightly emarginate. Frons short, laterally rounded, very declivous to vertex, slightly convex. Clypeus little longer than broad, parallel-sided; genae rather long. Pronotum transverse, lateral margins rather short, not carinate. Posterior tibiae flattened, rather elongate. Tegmina broad, laterally rounded, venation rather obscure, apparently not unlike that of *Graphocraerus*; wings like *Graphocraerus*.

1. *formiceticola*, sp. nov.

Piceous; vertex with a short longitudinal line on each side close to the middle, a short transverse line nearer the lateral margins, about 3 specks near the anterior margin, testaceous. Pronotum with about 12 specks and scutellum with 4, testaceous. Tegmina subopaque piceous, with brownish testaceous subhyaline spots. Abdomen piceous, legs sordid testaceous.

Male: Frons sordid testaceous.

Female: Frons piceous variegated with testaceous.

Length: (male) 2; (female) 2¼ mill.

Hab: Queensland, Bundaberg, Sandhills, in an ant's nest (x).

Subfamily *Penthimiinae*.

This subfamily (Gyponidae or Scaridae of some authors) is usually considered to be closely allied to the Tetigoniinae, but I suspect that this view is due mainly to the ocelli being dorsal.

Thaumatoscopus, gen. nov.

Allied to *Gypona* Germar; somewhat of the form of *Ledropsis*, but more fragile, and shorter. Head a trifle narrower than the anterior margin of pronotum; vertex transverse, foliaceous, produced well in front of eyes, very thin in profile. Ocelli small, discal, situated just above the imaginary line joining anterior margin of eyes. Pronotum transverse, lightly transversely striate, middle three-fifths of anterior margin truncate, posterior margin only a slightly sinuate. Scutellum transverse, lightly transversely striate.

1. *galeatus*, sp. nov. (Pl. XXX, fig. 8.)

Luteotestaceous; foliaceous part of frons orangered; the rest, as well as the basal two-thirds of genae and the base of clypeus

and of lorae, black; rest of face, the rostrum, anterior and intermediate legs, testaceous. Prosternum and 4 spots on the apical margin of the scutellum, black. Tegmina pale luteotestaceous, more or less hyaline, veins opaque, pale luteous. Wings dark smoky. Abdomen yellowish, more or less suffused discally with brownish, sparingly marked with black. Posterior femora and tibiae mostly black.

Vertex and venation figured.

Female: Last segment transverse, apically bisinuate, the short median prolongation very minutely notched.

Length: 7 mill., breadth $2\frac{3}{4}$ mill.

Hab: Queensland, Cairns (viii).

Vulturnus, gen. nov.

Closely allied to *Thaumatoscopus*, but head only slightly foliaceous anteriorly; cells of tegmina irrorate. Type *vulturnus.*

1. *vulturnus*, sp. nov.

Pale orange, somewhat sordid, the pronotum somewhat suffused with olivaceous. Scutellum with anterior angles and a short slender median transverse line, olivaceous. Foliaceous part of vertex, a spot on the disk and the lateral margins, of the genae, etc., orange; rest of sterna, sternites, etc., testaceous. Tegmina subhyaline costally, milky subopaque inwardly, veins brown and yellowish, cubital area with many short transverse veins, inner discoidal and the two inner subapicals closely irrorate; clavus irrorate. Wings dark smoky. Vertex similar in shape to *Thaumatoscopus*, but shorter.

Female: Last segment transverse, bisinuate, slightly produced obtusely in the middle, last sternopleural segment toothed intero-laterally near the base. Ovipositor black.

Length: $4\frac{1}{2}$ mill.

Hab: Queensland, Cairns (viii).

Ectopiocephalus, gen. nov.

This remarkable genus is readily distinguished by the exceedingly declivous pronotum, and the structure of the vertical head. It is Cercopoid in appearance. Vertex apical, slightly convex, transverse, head dorsally anteriorly with (what is probably) a large part of the frons visible, forming a suboval plate in the

same plane as the vertex. Ocelli immediately basal of this, much nearer the eyes than to one another. Frons excavate as in the other genera, but the head not at all foliaceous. Pronotum roundly declivous, anterior margin rounded in front, posterior margin roundly emarginate medianly. Tegminal venation obscure, subreticulate; with an appendix.

1. *vanduzeei*, sp. nov. (Pl. XXX, figs. 6-7.)

Bluish black; vertex, pronotum and scutellum polished; beneath dull black. The whole surface more or less covered with red powder, doubtless similar to the white flocculence of the Fulgoroidea. The dorsal part of the frons, eyes, and small false-ocellar spots on vertex, etc., are certainly red, and possibly other parts, but it is impracticable (in the unique type) to determine what is colour, what powder.

Length: 6¾ mill.

Hab: Queensland, Bundaberg (xi).

Subfamily Agalliinae.

Ipo, gen. nov.

Distinguished from *Idiocerus* by the quite different ventaion, especially the constitution of the discoidal cells and the presence of 5 apicals; there are also transverse veinlets towards the apex of the subcostal (marginal) cell, and there are 2 transverse veins standing on the cubital. The antennal ridges also extend only about one-half of the distance from frons to eye, and are shallow.

Very little of the vertex can be seen dorsally, and the eyes are prominent, not forming part of the curve of the head; the apical margin of the vertex is ventral and is emarginate roundly, to admit the base of the diamond-shaped frons; ocelli placed a little laterally, right against the frons, close to the apical margin of the vertex. Frons with a very slight, ovate swelling in the center, from base to apex. Clypeus oblong, longer than wide, lorae rhomboid, about as wide or a little wider, each, than clypeus, slightly rounded posteriorly exterolaterally. Rostrum about twice as long as clypeus. Antennae socketted on a level with the posterior margin of the eyes, simple in both sexes. Vertex and pronotum transversely, finely, but a little irregularly, aciculate-punctate. Head and eyes distinctly wider than

pronotum, the latter transverse, roundly declivous anteriorly, lateral margins obsolescent, anterior and posterior margins meeting acutely. Costal margin arched; clavus punctured. Membrane with an appendix. Wings with supernumerary cell. Posterior tibiae deeply grooved, with a row of about 7 strong setiferous spines. Type *ambita*.

1. *ambita*, sp. nov.

Head and pronotum pale testaceous, the vertex and pronotum strongly clouded with blackish brown, without definite spots. Scutellum pale castaneous. Underside and the tergites pallid, pleural region more or less crimson. Tibaei, tarsi and apical parts of femora more or less blackish brown. Tegmina hyaline, basal fourth clouded with black, two narrow transverse stripes and apex of corium blackish-brown.

Male: Valve in profile elongate, rounded apically. Frons clouded also with black. Clypeus black.

Female: Last abdominal segment more or less straight medianly; valve long, depressed in a wedge shaped manner at the base.

Length: (male) 7½; (female) 9½ mill; breadth across eyes 4¼-5 mill.

Hab: Queensland (one male in my collection), Bundaberg (3 females).

2. *conferta*, sp. nov. (Pl. XXII, figs. 10-11).

Smaller than the type, tegmina not narrowed so suddenly apically, and the interior subapical cell very short. Pleural region not reddish. Frons, clypeus, etc., concolorous, pallid in both sexes; a narrow longitudinal pale line on head and pronotum. Tegmina dark, mottled with whitish, with a broad undulating discolorous band from nearly the middle of the subcosta to lateral margins of scutellum; exteroapical third hyaline, veins black. Scutellum with anterolateral angles broadly dark.

Male and female: Valve rounder and shorter than in *I. ambita*.

Length: 6¼ mill.

Hab: Queensland (my collection), Brisbane (xi), Bundaberg (ix-xii), Koebele's No. 2300.

The nymph has spineless legs.

3. *honiala*, sp. nov.

Smaller than *I. conferta*, the head and eyes only slightly wider than pronotum; tegmina narrow and not so rounded subcostally, venation more irregular. Frons, etc., pallid, median part of the former clouded with blackish brown, lorae and clypeus each with a dark median mark, and the genae smudged with black. Tegmina brownish hyaline, more or less colourless apically; there is a curved whitish fascia on the basal half from basal angle to nearly half the length of the subcosta, the curve not nearly touching the length of the subcosta, the curve not nearly touching the commissure; veins partly whitish. Lorae each about twice as wide as the clypeus and well rounded exterolaterally. Genital segments on the plan of *I. conferta*.

Length: $5\frac{1}{2}$-$5\frac{3}{4}$ mill.

Hab: Queensland, Brisbane (vi).

4. *aegrota*, sp. nov.

About the same size as *I. honiala*, but the eyes are larger and more prominent, especially laterally; tegmina more narrowed apically; lorae not so rounded exteriorly, little wider than the clypeus.

Pale testaceous; vertex, pronotum and scutlelum more or less clouded with brownish, no definite markings. Tegmina hyaline, more or less tinged with yellowish, more or less obscurely clouded with brownish and with an ill-defined whitish fascia near the base.

Length: 6 mill.

Hab: Queensland, Cairns (viii).

Idiocerus, Lewis.

Idiocerus Lewis 1835 T. E. S. London, I, 47, Pl. VIII, fig. 2. Van Duzee 1894 T. Amer. E. S. XXI, 260; Edwards 1896 Hem. Hom. Brit. Isl., 97, Pl. I, f. 31, Pl. XXI and XIII, figs. 1-6; Pl. XXIIX, f. 1; Osborn & Ball 1889 P. Davenport A. N. S. VII, 124-38, Pl. III.

Bythoscopus subg. *Idiocerus* Burm. (1838?) Gen. Ins. Bythoscopus, figs. 5, 6.

1. *ipo*, sp. nov.

About the size and form of *I. nigroclypeatus*, Mel.

Bright greenish or greenish yellow, immaculate. Pronotum

(except lateral margins), scutellum, axillary cell of clavus, commissure, etc., crimson. Eyes black. Tegmina hyaline, tinged with grenish basally and exteriorly; veins greenish. Pleural region, etc., pale yellowish. Clypeus broad, fairly parallel-sided.

Female: Last segment very obtusangularly emarginate, valve pale yellowish, transverse, apically truncate, sides rounded. Ovipositor crimson.

Length: $4\frac{1}{8}$ mill.

Hab: Queensland, Brisbane (vi).

The following are species of Tetigoniidae described from Australia, but unrecognizable by their descriptions:

1. *Coelidia australis* Walker 1851 List. 856, referred to *Bythoscopus* auct. by Stal.
2. *Bythoscopus rivularis* Walker op. c., 865=*dorsalis* Walker op. c., 867=*repletus* Walker 1858 Suppl. 267.
3. *B. fulvus* Walker 1851 List. 866=*latifrons* 869.
4. *B. anguliferus* Walker, op. c., 868.
5. *B. transversus* Walker, op. c., 869.
6. *B. luridus* Walker, op. c., 870.
7. *B. cupreus*, Walker, op. c., 871.
8. *B. australis*, Walker, op. c., 872.
9. *B. obliquus* Walker, 1858 Suppl., 267.
10. *B. abscondens*, Walker, l. c.
11. *B. punctivena*, Walker 1858 Ins. Saund. Hom. 104.
12. *B. multistriga*, Walker, op. c., 105.
13. *B. signifrons*, Walker, op. c., 106.
14. *B. testaceus*, Walker 1852 List. 1163.
15. *Scaris australis*, Walker 1858 Suppl. 267.
16. *Iassus detractus*, Walker, op. c., 271.
17. *Gypona nigra*, Walker 1862, J. Ent., I, 319.
18. *Trocnada dorsigera*, Walker 1858 Ins. Saund. Hom. 104.
19. *Albelterus incarnatus*, Stal 1865 O. V. A. F., XXII, 158.
20. *Rubria* (*Petalocephala*) *sanguinea* Stal. l. c.
21. *R. carnosa*, Stal, op. c., 159.
22. *Macroceps fasciatus*, Signoret 1880 A. S. E. France (5) X, 364. Pl. 10, f. 89.
23. *Ledromorpha vaginata*, Stal 1864 op. c., (4), IV, 68.
24. *L. planirostris* (Don.)—sec. Stal. (This has been previously referred to under "*Ledra*").
25. *Ledropsis coccinea*, Butler 1874 P. Zool. S., London, 673.

PARTIAL BIBLIOGRAPHY.

The literature on Leaf-hoppers is so extensive and scattered, that only a very partial bibliography is possible.

(a) *Systematic.*

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See also Sahlberg, 1871, Osborn & Bull, 1897, etc.

Description of Plates.

Plate XXI.

1. Tegmen of *Scolypopa australis.*
2. The same of *Siphanta acuta.*
3. The same of *Philadelpheia pandani.*
4. The same of *Lamenia kulia.*

Plate XXII.

1. *Phrynophyes parvula*, female.
2. The same in profile.
3. Face of the same.
4. *Giffardia dolichocephala*, female.
5. Face of the same.
6. *Macroceratogonia aurea*, female.
7. Face of the same.
8. *Anemochrea mitis*, female.
9. Face of the same.
10. *Ipo conferta.*
11. Face of the same.
12. *Aneono pulcherrima.*

Plate XXIII.

1. *Tetigonia parthaon.*
2. Face of same.
3. Nymph of same.
4. *Epipsychidion epipyropis.*
5. Face of same.
6. Nymph of same.
7. *Kosmiopelex varicolor.*
8. Face of same.
9. *Thaumatoscopus galeatus.*
10. Face of same.
11. Head of same in profile.

12. *Polychaetophyes serpulidia*, nymph skin in profile.
13. "Operculum" of the same.

Plate XXIV.

1. *Rhotidus flavomaculatus*, female.
2. Face of the same.
3. Nymph of the same.
4. Face of the same.
5. *Cephalelus brunneus*.
6. Face of the same.
7. *Phrynophyes phrynophyes*, female.
8. Face of the same.
9. *Tartessus syrtidis*, face.
10. Nymph of unknown membracid.
11. Nymph of another unknown membracid.
12. Face of same.

Plate XXV.

1. *Kyphocotis tessellata*.
2. The same in profile.
3. *Stenocotis planiuscula*, female.
4. Female of probably the same species.
5. Nymph of probably the same species.
6. Face of No. 3.
7. Apical sternites of the same.
8. The same of No. 4 in profile.

Pl. XXVI.

1. Ova of *Perkinsiella saccharicida* in situ, those at the sides being shown somewhat in profile and in section.
2. The same isolated.
3. *Perkinsiella saccharicida*, nymph of first instar.
4. The same, second instar.
5. The same, third instar.
6. The same, fourth instar.
7. Face of the same.
8. Adult female of same, brachypterous form.

Pl. XXVII.

1. Adult male of *Perkinsiella saccharicida.*
2. Face of same.
3. Genital segments of same.
4. Adult female of same, macropterous form.
5. Genital segments of same.
6. Nymph of *Vanua vitiensis.*
7. Face of same.
8. Nymphcase of *Pectinariophyes pectinaria.*
9. The same of *Polychaetophyes serpulidia.*

Pl. XXVIII.

1. *Phantasmatocera vitiensis*, head, etc.
2. The same in profile.
3. Tegmen of the same.
4. *Sardis maculosa*, head, etc.
5. Face of the same.
6. Tegmen of the same.
7. *Vanua vitiensis*, head, etc.
8. Face of same.
9. Tegmen of same.
10. *Astorga saccharicida*, head, etc.
11. The same in profile.
12. Face of the same.
13. Tegmen of the same.

Plate XXIX.

1. *Gelastissus albolineatus.*
2. Head of same in profile.
3. *Phaconeura froggatti.*
4. Face of same.
5. *Dardus abbreviatus*; nymph.
6. *Thyrocephalus leucopterus*, head and nota.
7. Face of same.
8. *Philadelpheia pandani*, head and nota.
9. Face of same.
10. *Thanatodictya hebe.*
11. Nymph of an allied form.

Pl. XXX.

1. *Tetigonia pasiphae*, vertex.
2. *Gelastorrhachis diadema*, pronotum from in front.
3. The same in profile.
4. *G. clavata*, pronotum from in front.
5. The same in profile.
6. *Ectopiocephalus vanduzeei*, vertex.
7. Head of the same in profile.
8. *Thaumatoscopus galeatus*, head, etc.
9. *Polychaetophyes serpulidia*, head, etc., in profile (slightly tilted).
10. *Swezeyia lyricen*, head, etc., in profile.

Plate XXXI.

1. *Thaumatoscapus galeatus*, tegmen.
2. *Ancono pulcherrima*, the same, (only the veins that are certainly visible are portrayed).
3. The same, more or less restored; the venation is so obscure in parts that it is difficult to determine it correctly.
4. *Issus ridicularius*, tegmen.
5. *Rhotidus monstrum*, the same.
6. *Eupteryx haematoptilus*, the same.
7. *Nesosteles hebe*, the same.
8. *Rhotidus ingens*, vertex.
9. *R. informis*, the same.
10. *R. monstrum*, the same.
11. *R. ledropsiformis*, the same.
12. *R. viridescens*, the same.
13. *R. horrendus*, the same.

Plate XXXII.

1. Wing of a Tetigoniine.
2. The same of an Eupterygine. N. B. '10' is really the submarginal, the wing having undergone degeneration apically.
3. Wing of an Agalliine.
4. The same of an Asiracid.

5. Claval and corial membranous appendages in *Polychaetophyes serpulidia*.
6. *Gelastocephalus ornithoides*, head and nota.
7. The same in profile.
8. *Nesosteles hebe*, head and pronotum.
9. *N. sanguinescens*, the same.
10. *Pettya anemolua*, the same.
11. *Siphanta galeata*, the same.
12. *Dryadomorpha pallida*, the same.
13. The same in profile.
14. The same in profile, dorsally tilted.
(In 12-17, *a*=sensory pit, *b*=ocellus).

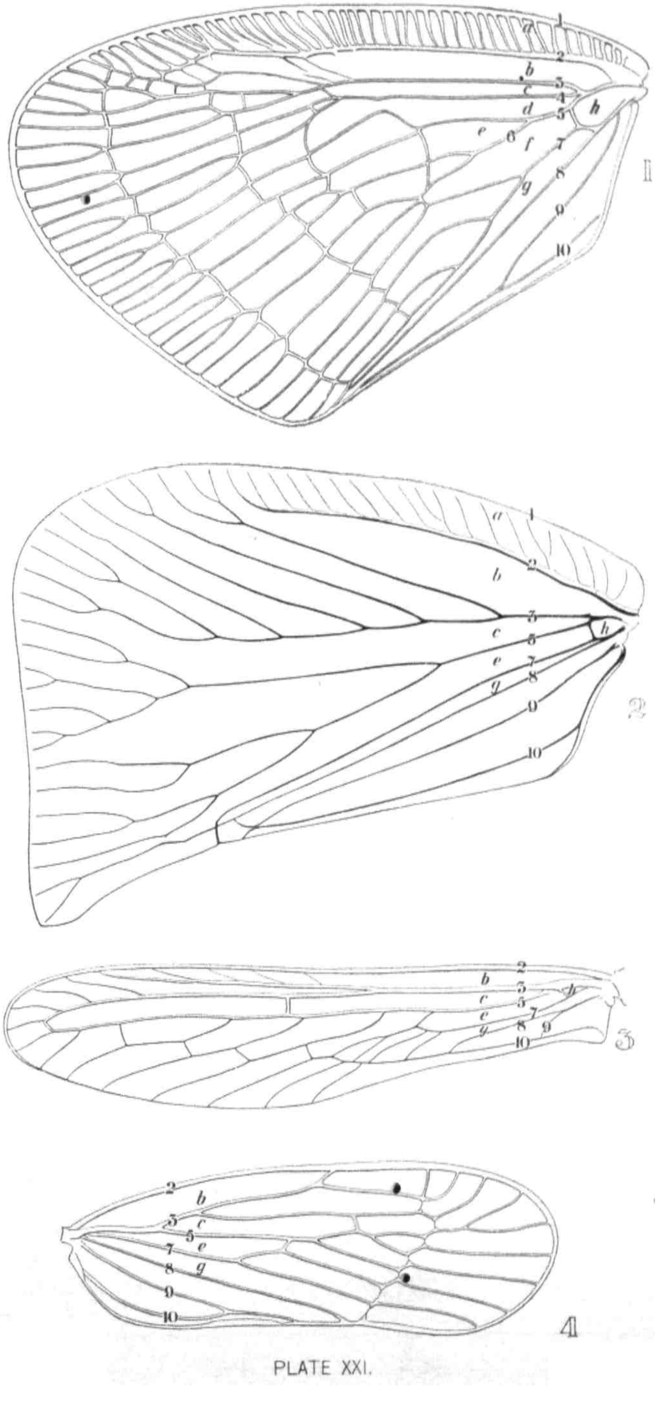


PLATE XXI.

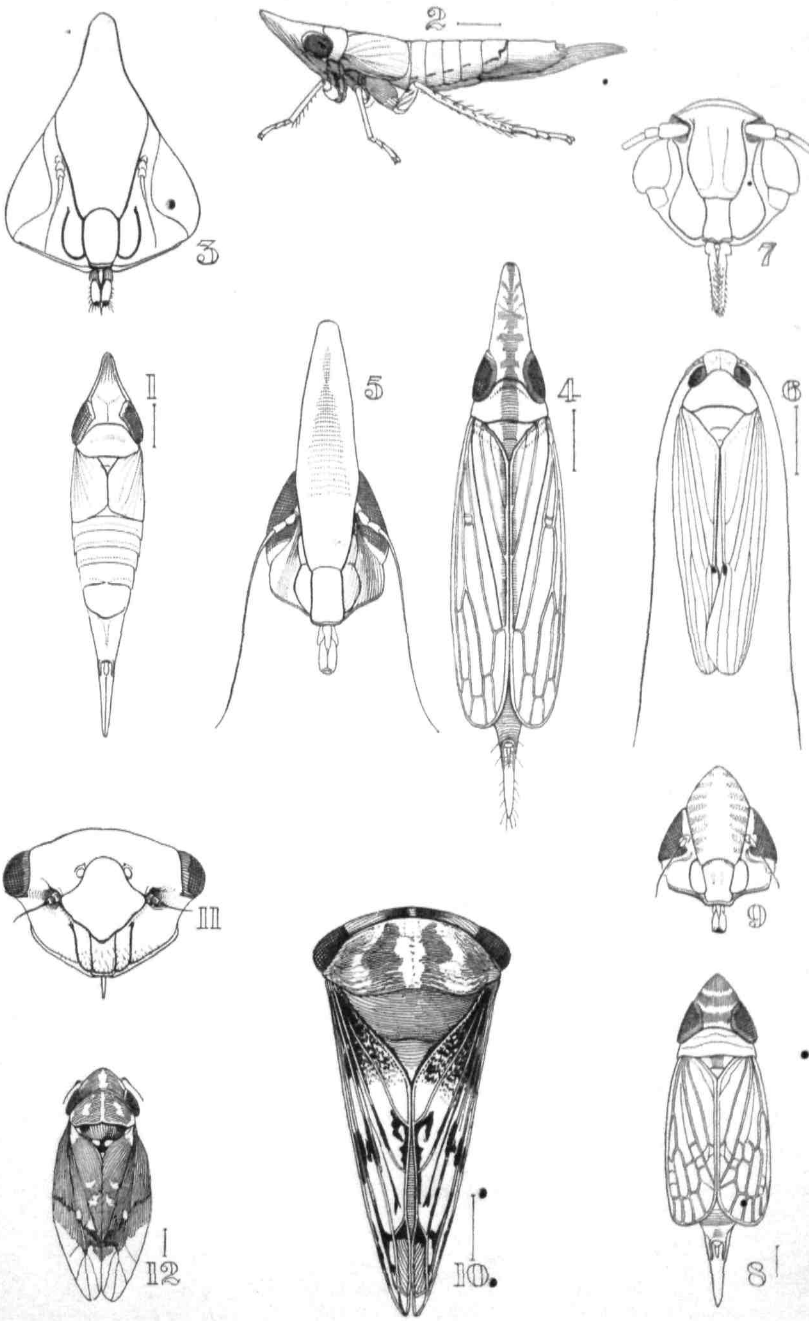


PLATE XXII.

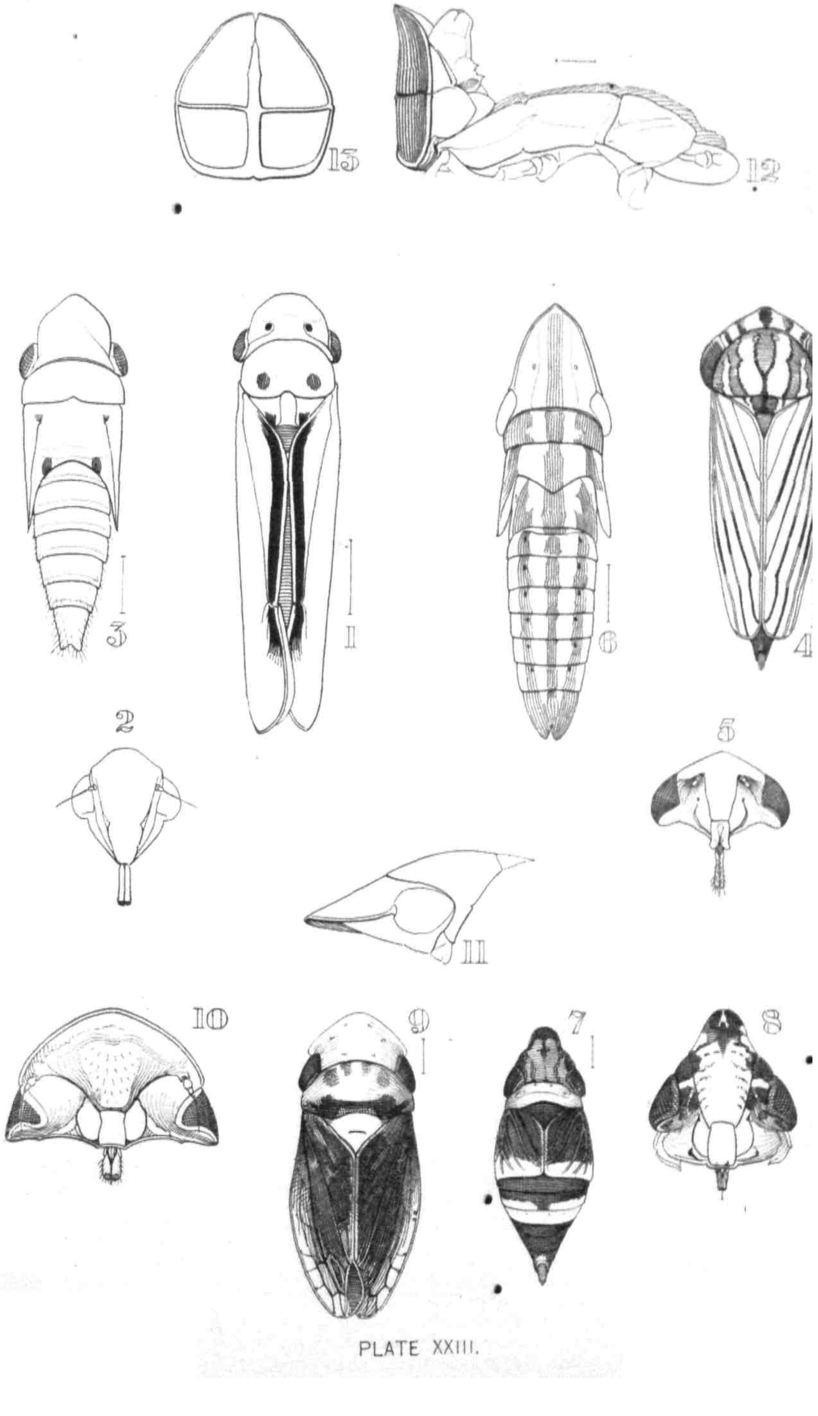
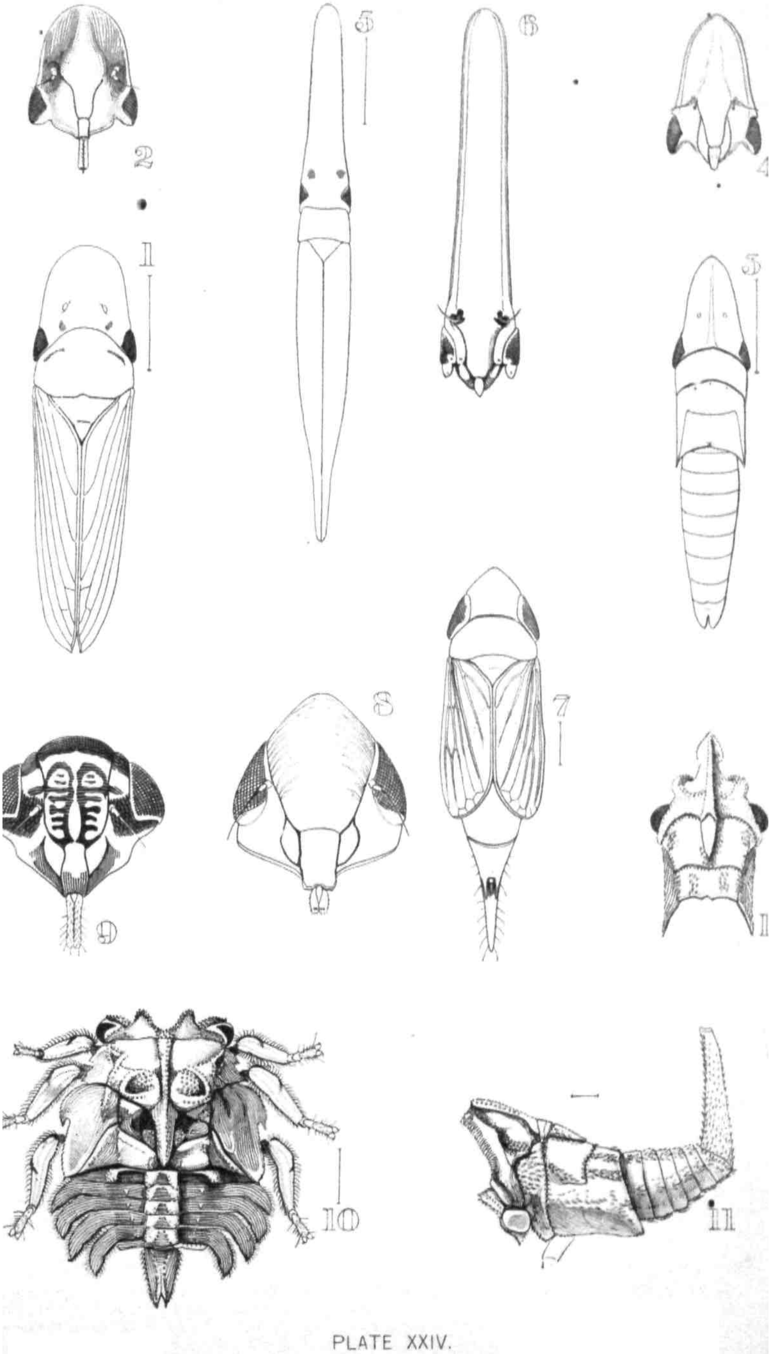


PLATE XXIII.



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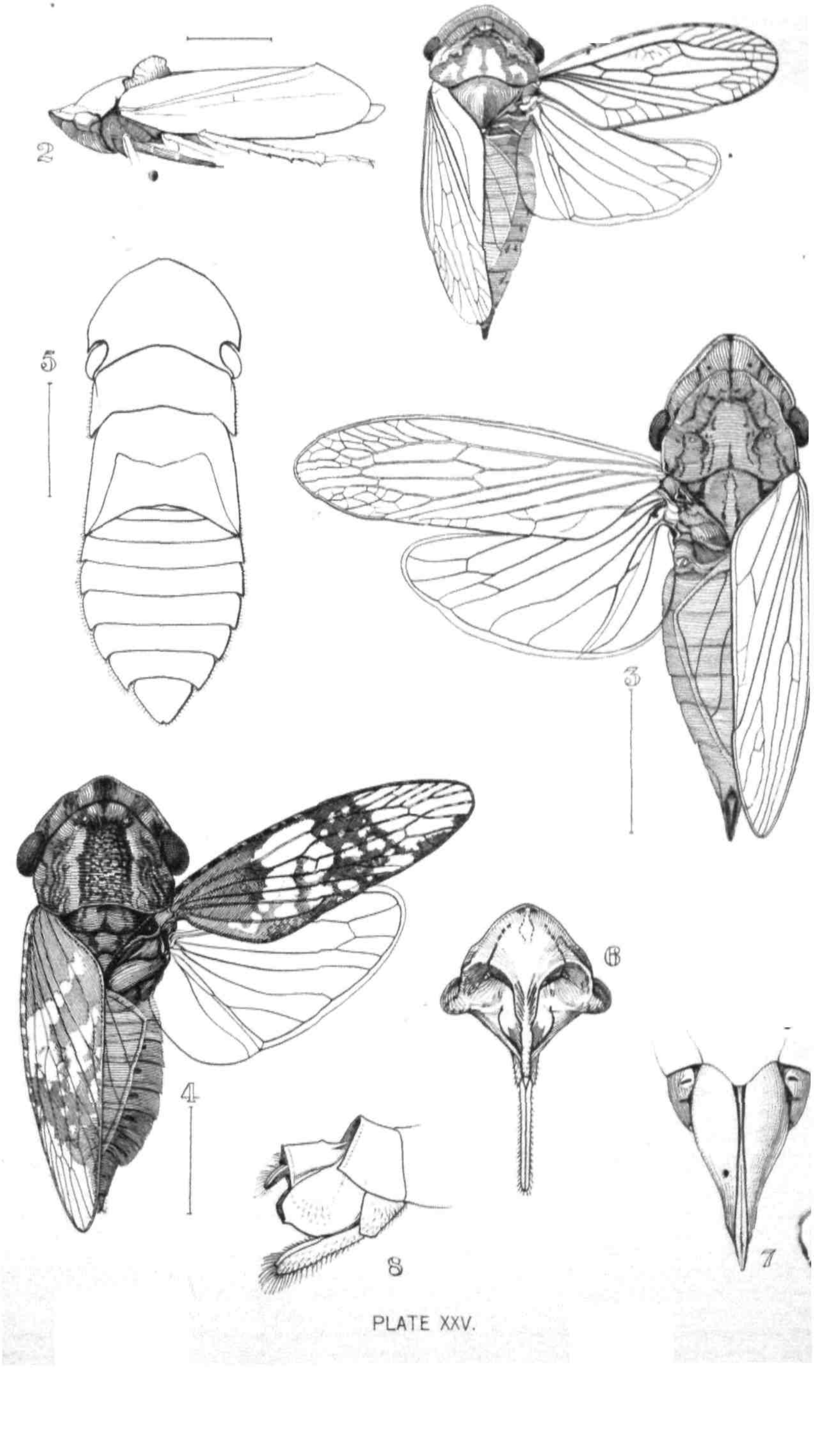

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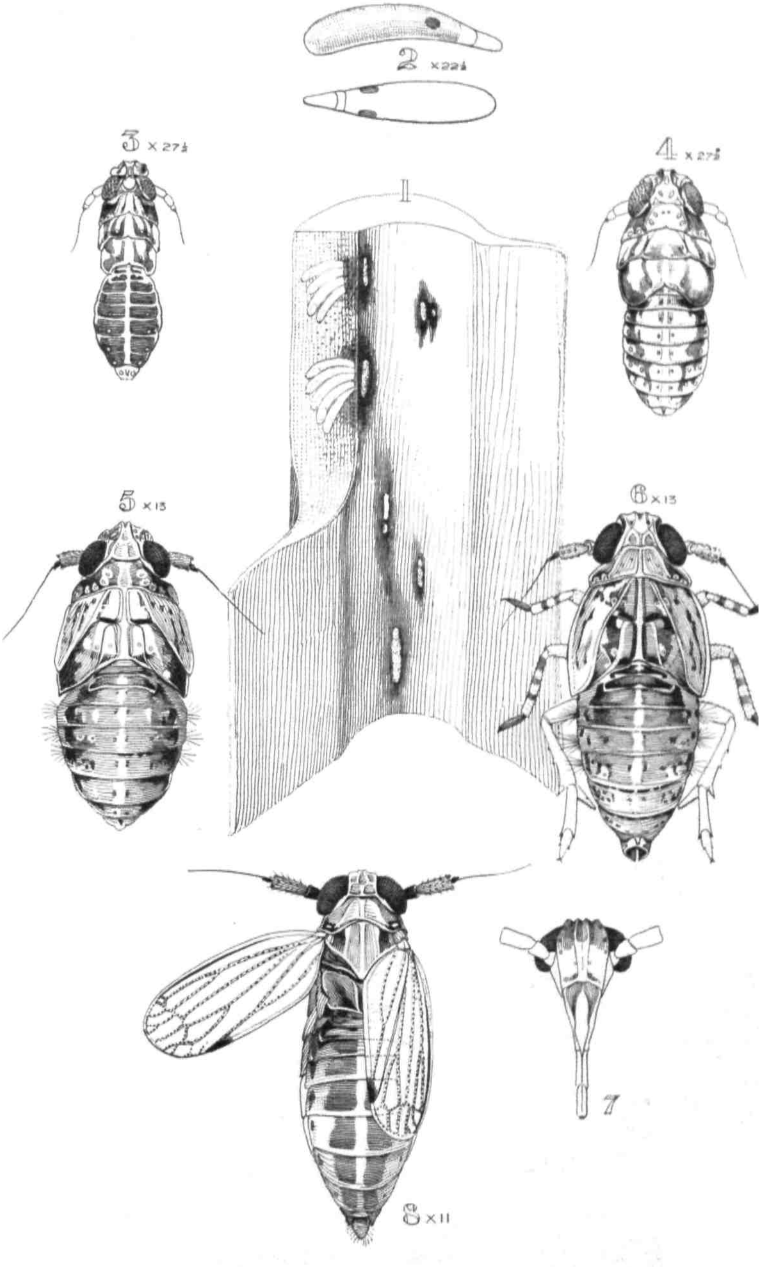


PLATE XXVI.

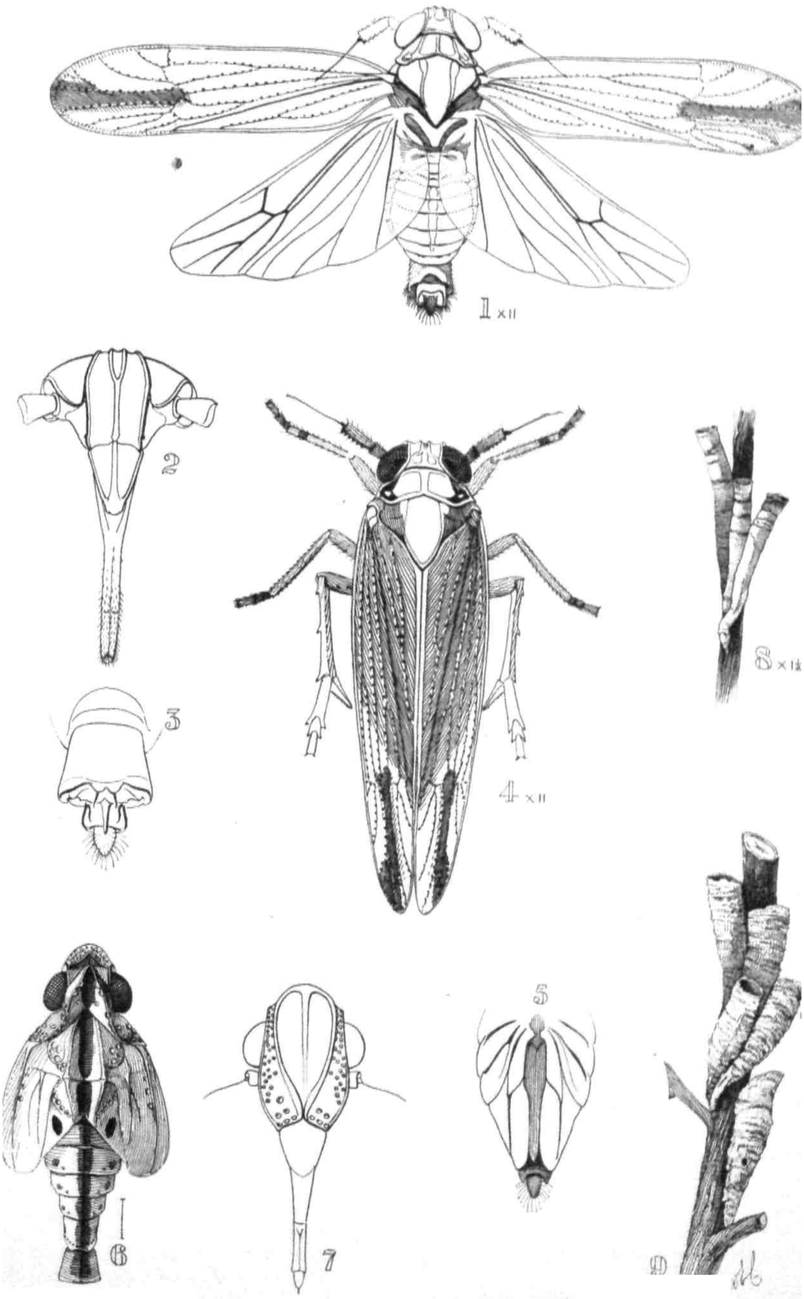


PLATE XXVII.

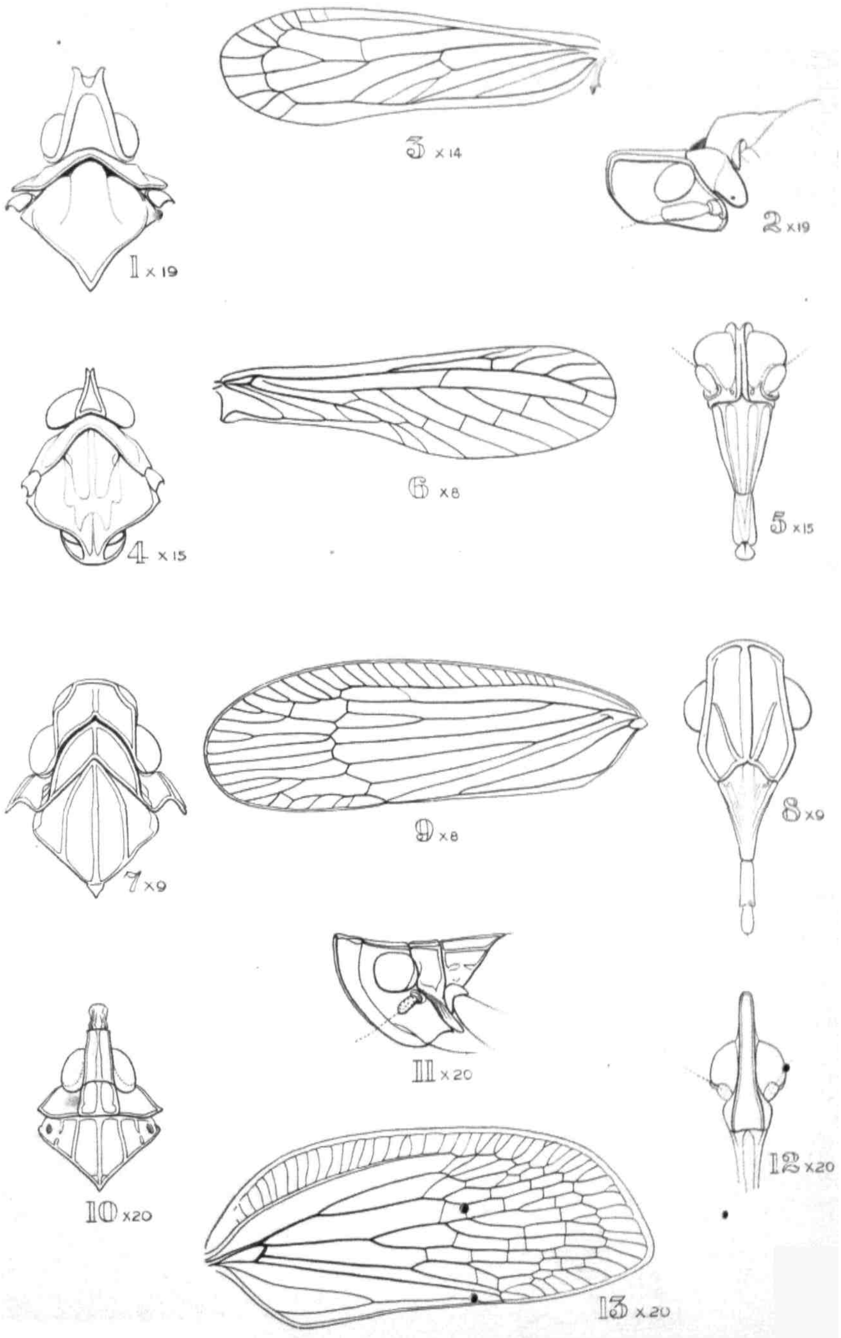


PLATE XXVIII.

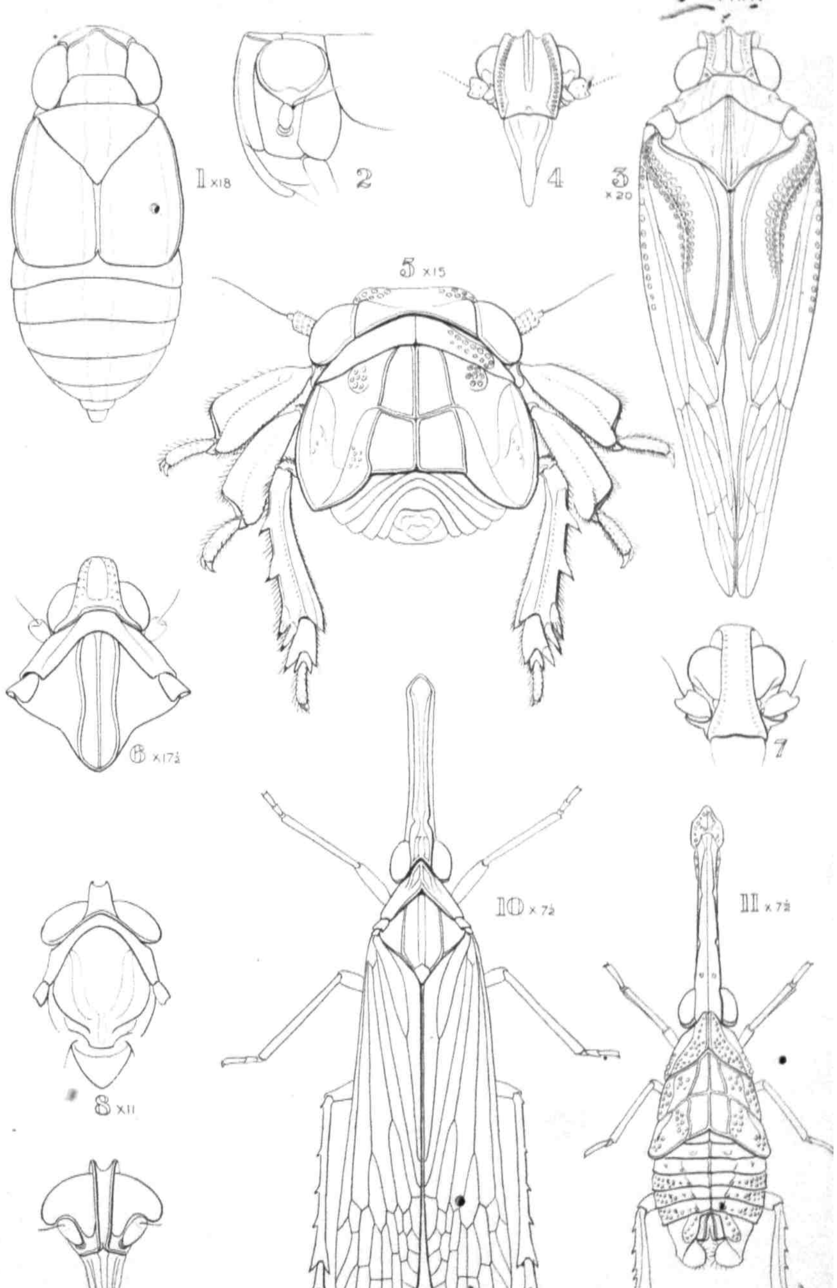
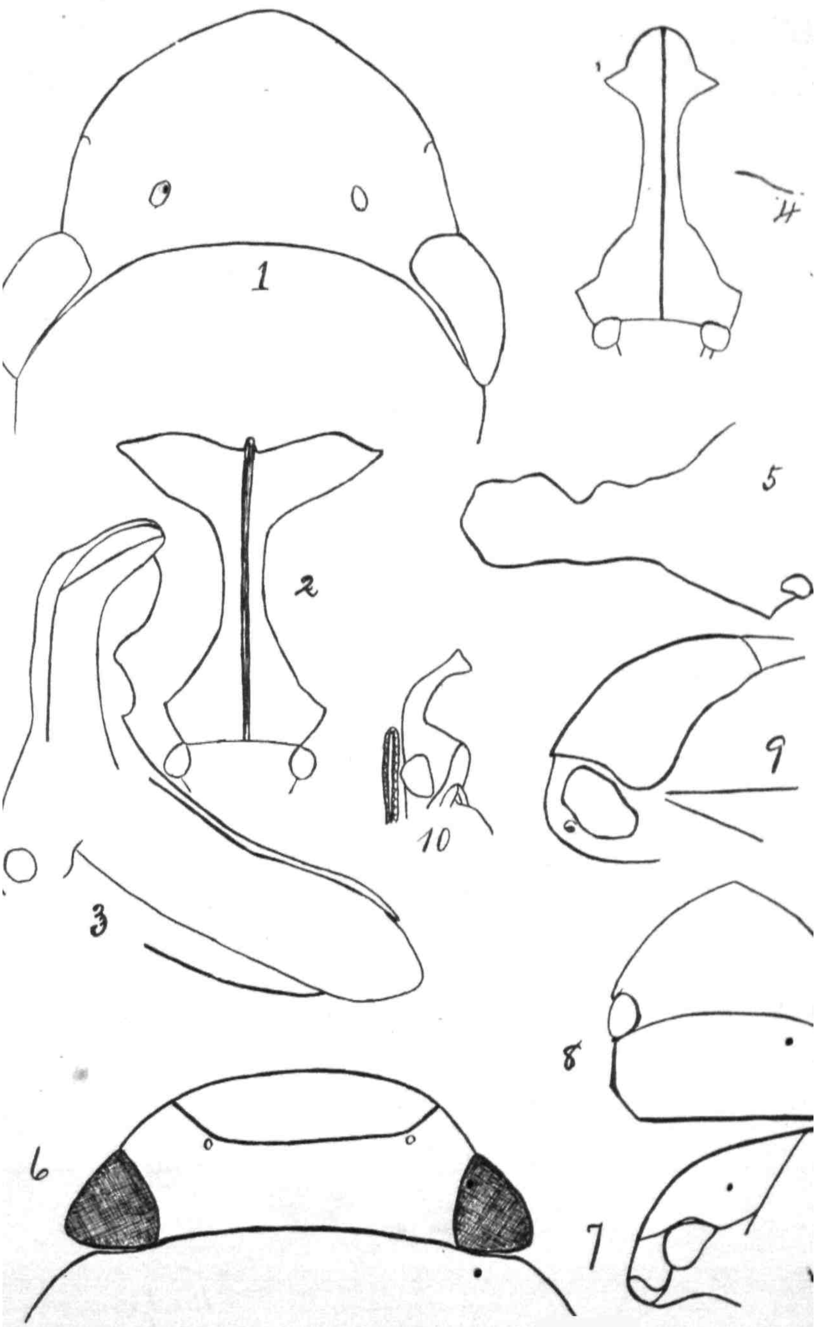
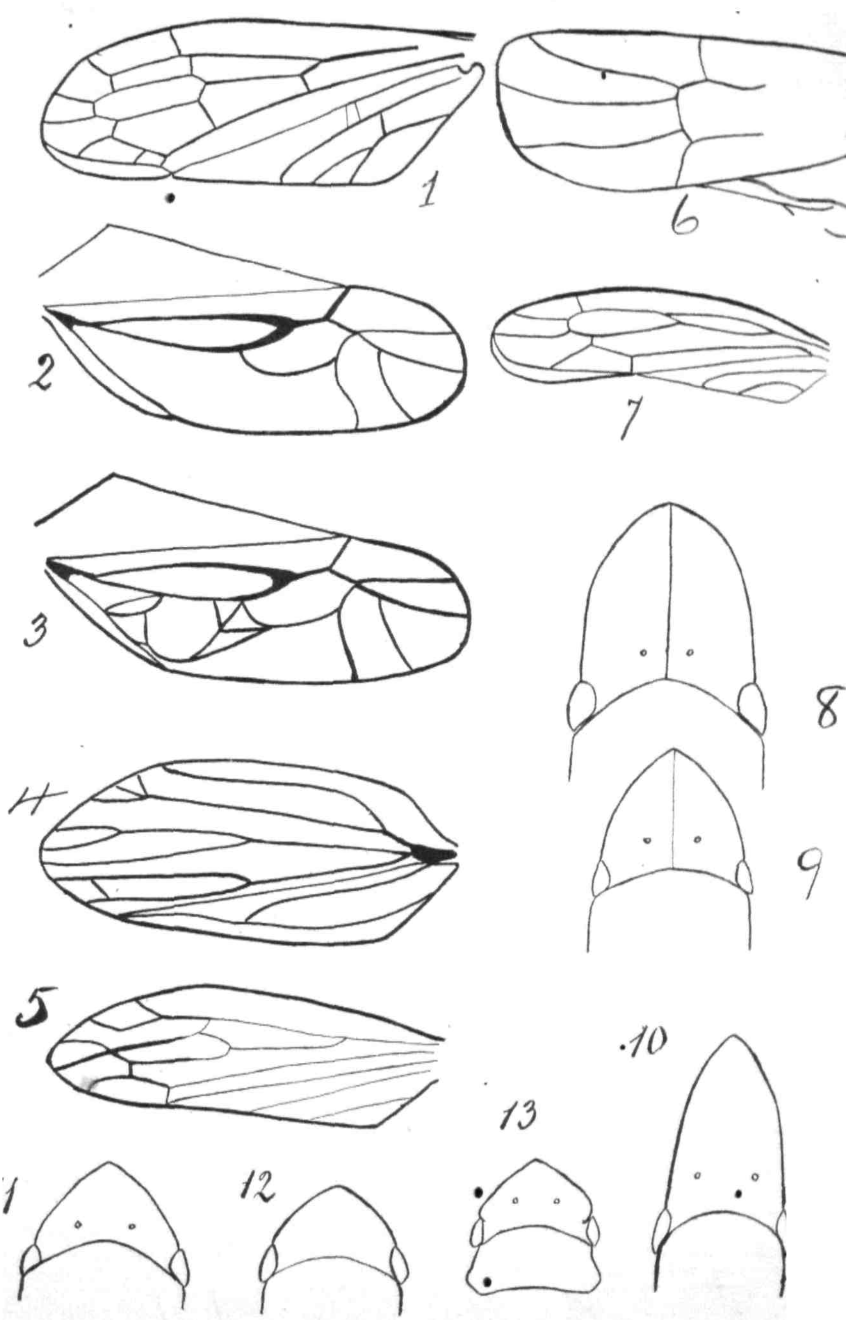


PLATE XXIX.



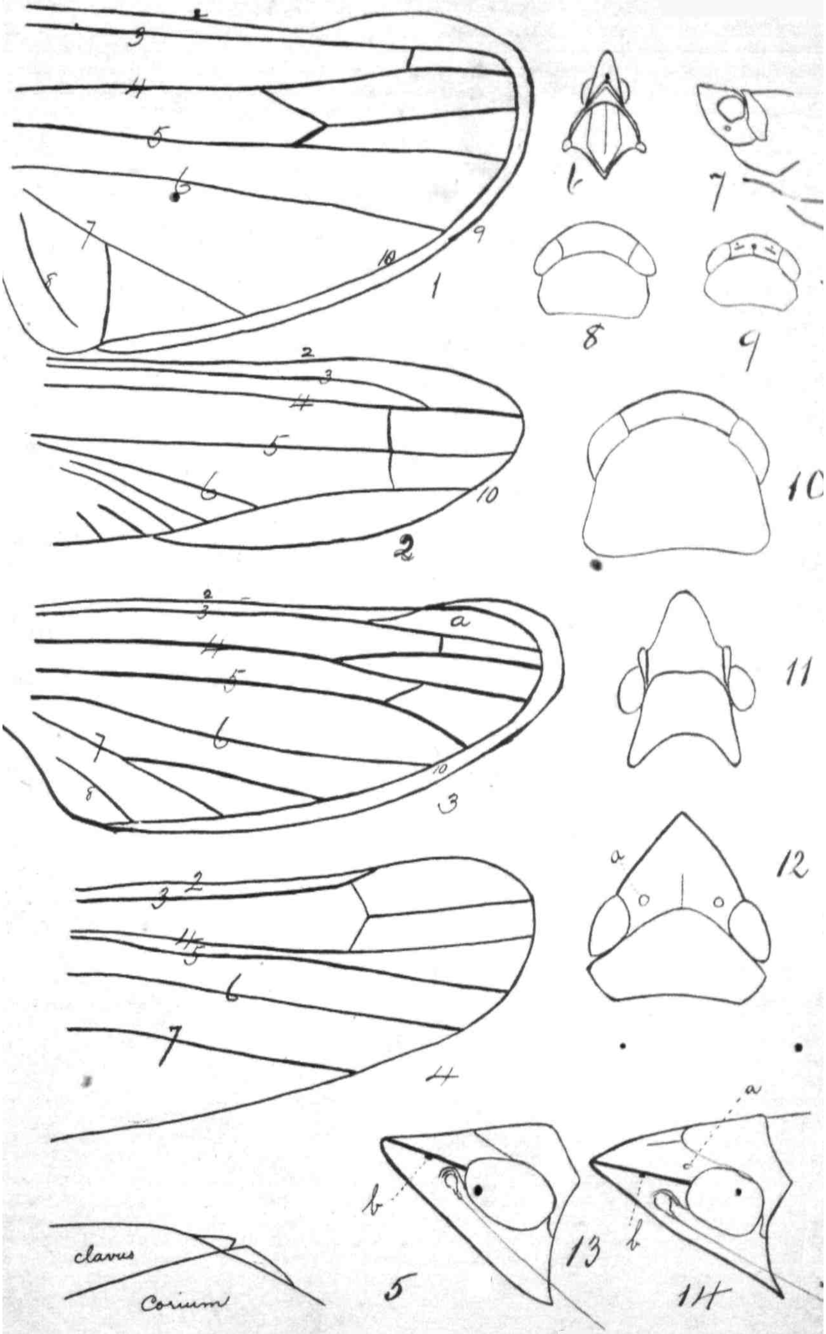
Kirkaldy del.

PLATE XXX.



Kirkaldy del.

PLATE XXXI.



Kirkaldy del

PLATE XXXII.

LETTER OF TRANSMITTAL.

Honolulu, T. H., January 17th, 1906.

To the Committee on Experiment Station, H. S. P. A., Honolulu, T. H.

Gentlemen:—I herewith submit for publication the tenth part of the Bulletin on "Leaf-Hoppers and Their Natural Enemies," which is chiefly supplementary to the first part, and deals with observations made and material collected by Mr. Koebele in Australia and Fiji. This material was not available until the first part of the Bulletin had already been completed.

Yours obediently,

R. C. L. PERKINS,
Director, Division of Entomology

INTRODUCTORY REMARKS.

In Part I of this bulletin I detailed the habits of some Dryinidae, and described a large number of species, obtained partly as the results of Mr. Koebele's investigations in N. America, and more especially, through our researches in Queensland, from June to December, 1904. I now have to record the additional material that Mr. Koebele secured after my return to Honolulu, when he was continuing his researches for a few months in New South Wales and Fiji. In my introductory remarks on the Dryinidae I was only able to merely mention a recent paper by Dr. J. J. Kieffer on these insects, but as this paper throws light on some obscure points, and corrects several errors of older observers, I shall allude to these matters below, as well as making corrections of some clerical errors in my former paper. I also add a full description of that very distinct parasitic fly *Pipunculus cutrichodes*. In Part IV of this bulletin this species was omitted in the list of species on p. 131, and no detailed description was given subsequently, but both sexes were merely briefly characterized in the "Synopsis of Species" on p. 133 and 135.

As the first part of this bulletin dealing with the chief part of our material, was altogether without figures, I have now made drawings of many of the important structures therein described.

GENERAL REMARKS.

The number of new species of Dryinidae obtained in New South Wales and Fiji was not large, four from the former State, and the same number from the islands; in addition to which I describe two new species from Queensland. It should be mentioned that of the species already described from Bundaberg, Queensland, which is well outside the tropics, several were afterwards found by Mr. Koebele at Sydney, such species as *Paradryinus koebelei* and *Neodryinus raptor* being common there. At Sydney both of these frequently attack Fulgorids of much smaller size than those which are found infested at Bundaberg. Consequently the Sydney specimens are of very small size as compared with the Queensland examples, but do not otherwise noticeably differ.

I have referred to the facts that a *Gonatopus* is said to have been bred from the beetle *Ptinus fur*, a statement so remarkable, as to need verification. Dr. Kieffer in the paper I have cited tells us that this so-called *Gonatopus* probably belongs to the genus *Cephalonomia* of the Bethylidae. He also states that the genus *Mystrophorus* has chelate tarsi in the female, Foerster having mistaken his specimens for this sex, when really they were males. In my synopsis of genera in Pt. 1, p. 33 of this Bulletin *Mystrophorus* will therefore have to be removed from the neighborhood of *Anteon*, which will remain as the sole representative of that section of Dryinidae, of which the species have simple front legs in both sexes.

I have still left undescribed the greater number of male Dryinidae obtained by us. It might be supposed that as nearly all our male specimens were bred, there would be no difficulty in determining the species to which these belong. This, however, is by no means the case, for most of the graminivorous Delphacids and Jassids, from which these parasites are obtained, are liable to be attacked by two or three different species, and as males and females of the parasites are not reared from a single individual hopper, but only one or other sex, the difficulty of pairing the sexes is hardly lessened by the fact that the specimens are bred. The matter is really quite complicated, for a Dryinid sometimes attacks many species of leaf-hoppers, and a given leaf-hopper may be attacked by a number of distinct species of these parasites, even when all are collected in the self-same locality. Occasionally even an individual hopper is attacked by two, or even three, species of Dryinid parasites, these usually belonging to at least two genera. It is quite common also to obtain Stylopid and Dryinid parasites from a single specimen of the host, and *Pipunculus* is sometimes associated with one or other of these, but usually with the latter.

Nearly all these difficult males belong to what was once called the genus *Labeo*. Ashmead shrewdly conjectured that *Labeo* was the male of *Gonatopus*, (*sensu lat.*) a conjecture partially correct. In *Labeo*, however, he included male *Dryinus*, as well as *Gonatopus*, although the latter are at once distinguished by their short maxillary palpi, etc., etc. As colonies of *Gonatopus* and its allies can easily be raised in confinement, there is no doubt but that the sexes will ultimately be correctly associated and the generic characters of the males properly established. In my opinion the structure of the palpi, the condition of the parapsides of the mesonotum, and the antennal joints, will be of most use for this purpose. Such, however, is rather the work of a

resident entomologist than of those on a temporary mission, and I do not feel disposed to create a number of new species on males of so-called *Labeo*, when many of these would ultimately fall as synonymous with species that I have already described from the other sex.

Additional material received from Koebele has shown no exception to the general rule that a species of Dryinid does not attack Fulgorid and Jassid indiscriminately. *Labeo typhlocybae* remains a most peculiar exception*, especially as the female (described originally as *Dryinus ormenidis*) of this species, of which I received some two thousand cocoons, is apparently attached only to certain species of one special group of the Fulgoridae. In my former paper I have remarked that the comparatively primitive forms of Dryinidae, having the stigma large and ovate, attack Jassids only. I have now met with a single exception to this rule. At Sydney on January 23rd, 1905, Koebele found an adult male of the Fulgorid, *Gaetulia chrysopoides*, a species frequently attacked in its nymphal condition by species of *Neodryinus* and *Paradryinus*, bearing beneath the body at the insertion of the hind coxae, the black sac of a Dryinid. The sculpture of the sac itself and likewise its position is so similar to that of *Neochelogynus* that I can hardly doubt that it belongs to this or some allied genus. Unfortunately the mature parasite was not bred.

I may say that the new species here described from Fiji and New South Wales, the fauna in each case being largely distinct from that of Queensland, fall admirably into the genera previously characterized by me. I have some doubts as to the value of my genus *Neodryinus*, as, having obtained Latreille's description of *Dryinus*, I find that this gives 3 joints to the labial palpi like the former, and four teeth to the mandibles. *Dryinus*, however, as interpreted by various hymenopterists, is, in my opinion, a composite genus, and I can not include such forms as *Dryinus americanus* Ashm. and the European *D. tarraconensis* Marshall, which have distinct and parallel parapsidal furrows, in the same genus as *D. ormenidis*, Ashm. and my several species of *Neodryinus*, which are without such furrows, because I attach the highest importance to the condition of the parapsides in the classification of the Dryinidae.

As most of the figures that I have drawn refer to Pt. 1 of this Bulletin rather than to the present, and necessarily no reference

* I have now reason to believe that this is not a true exception, on which matter see my remarks under *Dryinus* below.

to figures was given in that part, I have given the description of the plates at considerable length, when necessary.

SYSTEMATIC.

LIST OF GENERA AND SPECIES HERE DESCRIBED OR DISCUSSED.

The species marked with an asterisk have had the mouth-parts dissected out and mounted in balsam or glycerine.

DRYINIDAE.

Pseudogonatopus.
  * *P. melanacrias*, sp. nov.
  * *P. kiefferi*, sp. nov.
  P. perkinsi Ashm.
Haplogonatopus.
  * *H. vitiensis*, sp. nov.
  H. brevicornis, sp. nov.
Gonatopus.
  * *G. koebelei*, sp. nov.
Neogonatopus.
  * *N. vitiensis*, sp. nov.
Epigonatopus.
  * *E. fallax*, sp. nov.
Neodryinus.
Dryinus.
  D. ormenidis Ashm.
Chlorodryinus.
  C. pseudophanes, sp. nov.
Neochelogynus.
  N. ignotus, sp. nov.
Prosanteon.
  P. melanostigmus, sp. nov.

PIPUNCULIDAE.

Pipunculus eutrichodes, sp. nov.

DESCRIPTIONS OF SPECIES.

Pseudogonatopus.

On page 35 of Pt. 1, in the Synopsis of Species of this genus, the names *P. junctorum* and *P. saccharetorum* should be transposed.

Pseudogonatopus perkinsi, Ashm.

Gonatopus perkinsi, Ashmead, Faun. Haw. Vol. I, pt. III, p. 293.

Hab: Molokai, Maui, Hawaii, widely distributed, but not abundant. I have found the larval sac on Delphacids on *Pipturus* on the Island of Hawaii. There is little doubt that *Labeo hawaiiensis* Ashm. is the male, as I have taken this *Pseudogonatopus* in the same spot as the other.

Pseudogonatopus melanacrias, sp. nov.

Black, the face, the legs and the basal three antennal joints, pale, yellow or yellowish; the front femora more or less dark, the intermediate and posterior ones sometimes to a less degree darkened, the antennal joints, excepting the first three, black or at least dark, the apical joint not pale. Thorax generally entirely black, except the lateral and posterior margins of the pronotum, which are yellow or ferruginous. In one example the posterior lobe of the pronotum and the middle of the propodeum are more or less of a dark brown or pitchy colour. Head above dark brown or castaneous.

Antennae slender, the third joint long, twice as long as the fourth; top of the head shining and smooth, and moderately deeply concave. Pronotum with deep transverse furrow or constriction, the surface smooth and shining. Mesonotum very narrow, the propodeum long, the lateral anterior angles effaced, finely transversely rugose in front and posteriorly, and between these areas smooth and shining. The thorax is without clothing of erect hairs. The abdomen is smooth and shining and more or less yellow or brown just behind the petiole. Length 3 mm.

Hab: Suva, Fiji; bred from Delphacid on the grass *Zoysia pungens*.

Pseudogonatopus kiefferi, sp. nov.

Head above, and abdomen black; the thorax and legs ferruginous, the latter partly dark or black, especially the coxae, the middle and hind tibiae at the apex, and the tarsi on their apical joints. Lower part of face pale; antennae with the second, third and fourth joints, and the base of the fifth more obscurely, ferruginous, the apical joint yellowish, the scape yellowish or white, dark above.

Head very dull, with dense fine puncturation, the third antennal joint very long, nearly twice as long as the fourth, and three times as long as the second. Pronotum shining, with some sparse indefinite punctures; the propodeum dull, and coarsely rugose over its whole surface, the anterior lateral angles distinct, not so rounded off as to be effaced. The propodeal rugosity is transverse in front, then becomes more irregular and somewhat longitudinal, while posteriorly it is again regularly transverse. There is no erect pilosity, and the legs have only a very short and inconspicuous pubescence. The abdomen is smooth, shining and glabrous. Length 4.5 mm.

This large and beautiful species is distinguished from any other described by me by the very strong sculpture of the propodeum.

Hab: Suva, Fiji; bred from a cocoon collected by Koebele on a tree, on which many examples of a Fulgorid, *Vanua vitiensis*, were noticed.

Haplogonatopus.

In Pt. 1, page 39, line 10 from the top, for 'preceding' should be read 'following.' The mouth-parts of *Haplogonatopus* are similar to those of *Paragonatopus*, not *Pseudogonatopus*. The above correction was overlooked, when a rearrangement of the genera was made before publication.

Haplogonatopus vitiensis, sp. nov.

Black, but in parts, especially the thorax, dark brown, the legs obscure yellowish brown; two basal joints of the antennae and the third more or less at its base, yellow, the face and mandibles also yellowish, the teeth of the latter dark.

Head very deeply concave, black above, and with a very dense minute puncturation or sculpture rendering the surface dull. Antennae with the third joint less than twice as long as the fourth, the apical one only obscurely pallid at the tip. Pronotum dark brown, smooth and shining, the transverse furrow very obsolete; the mesonotum dull, rather paler than the pronotum, the propodeum bare, transversely rugose in front and posteriorly, and between these parts smooth and shining on the dorsum, the anterior lateral angles effaced. Abdomen black smooth and shining. Length $2\frac{1}{2}$ mm.

Hab: Suva, Fiji; one female from a Delphacid on *Zoysia pungens* (Koebele 2377). Bred with *Pseudogonatopus melanacrias*, which it considerably resembles superficially.

Haplogonatopus brevicornis, sp. nov.

Head and thorax dark brown or castaneous, the mesothorax and posterior part of propodeum paler, more yellowish brown; the face, two basal antennal joints, the third more or less, and the apical one, yellow or brownish yellow. Legs brownish fuscous, yellower in parts, the tarsi except the apical joints paler yellow. Abdomen black.

Head deeply concave, smooth and shining, the antennae short, the third joint about twice as long as the second, the seventh hardly longer than wide. Thorax smooth and shining, glabrous, and without evident sculpture, the propodeum strongly convexly raised, and very smooth on its anterior portion in front of the spiracles, posteriorly without transverse rugulosity, at most with very feeble indefinite sculpture. Legs without noticeable hairs. Length 2 mm.

This species is obviously distinct from *H. apicalis* by the smooth shining propodeum, apart from many other characters. Only a single specimen was bred, and, owing to the manner in which it is carded, I have not dissected the palpi, but it is probably rightly referred to *Haplogonatopus*. The variegated larval sac is like that of *H. apicalis*.

Hab: Tweed River, Queensland side. Koebele 2232.

Gonatopus koebelei, sp. nov.

Shining brown, abdomen and apical half of the antennae black, the legs for the most part paler than the thorax, the basal dilatation of the hind femora and their extreme tips noticeably darker than the part between.

Head above deeply concave, smooth and shining; second joint of antennae slender and quite elongate, the third longest of all and very greatly longer than the fourth. Thorax ferruginous brown, nearly unicolorous, or the mesonotum a little paler; mesonotum and propodeum with fine and long hairs, the latter finely transversly rugose posteriorly, elsewhere smooth and shining like the pronotum. Legs clothed with fine, longish hairs. Abdomen shining black, or slightly brownish-tinged, very sparsely pilose. Length 3 mm.

This is a true *Gonatopus* with 5-jointed maxillary palpi, three distinct joints beyond the geniculation.

Hab. Paramatta, Sydney, N. S. W.; bred from a Jassid (Koebele 2369).

Neogonatopus vitiensis, sp. nov.

Black, the lower part of face, the mandibles, except the reddish teeth, and the three basal antennal joints, yellow, the scape darker above. Front legs with the trochanters entirely pale or marked with fuscous, the femora black or dark brown and pale at the tips, tibiae dark above, the tarsi pale, yellow or brownish yellow. Middle and hind legs prettily variegated with dark and yellow, the trochanters, tip of femora and middle of tibiae being pale, the tarsi brownish, blacker towards the apex.

Head very little concave above, the surface not much shining, the microscopic sculpture excessively fine. Whole thorax sparingly clothed with short erect grey hairs; the pronotum more or less shining, the rest of the thorax duller, and densely minutely punctate or shagreened; the propodeum elongate and not at all abruptly raised in the spiracular region. Front trochanters unusually short and robust, not with the usual long stalk. Abdomen smooth and shining and very sparsely pilose. Length 3-3.5 mm.

This interesting species in the structure of the trochanters and the shape of the head approaches the genus *Pachygonatopus*.

Hab: Suva, Fiji; bred from a small Jassid on grass (Koebele 2378).

Epigonatopus fallax, sp. nov.

Black, the clypeus more or less yellowish, the mandibles white with red teeth, three basal antennal joints yellow; the abdomen behind the petiole slightly brownish or pitchy. Legs with the apices of the coxae, the trochanters for the most part, the apical thin part of the femora, except the tips of the hind ones, yellow; front tibiae and tarsi testaceous, middle and hind tibiae dark at base and tips and paler between, the tarsi fuscous. The superficial appearance of this species owing to its black colour and variegated legs is very like that of *Neogonatopus vitiensis.*

Head deeply concave, and the surface shining, the third antennal joint long and very slender, one and a half times as long as the fourth. Pronotum smooth and shining, the rest of the

thorax duller, propodeum elongate and not very high, very finely transversely rugulose at the sides and posteriorly, and without clothing of erect hairs. Legs not noticeably hairy. Length 3 mm.

This species differs greatly in superficial appearance from *E. solitarius*, which has a ferruginous thorax, but structurally it is rather closely allied.

Hab: Mittagong, N. S. W.: collected in grass, January 18th, 1905, by Koebele.

Neodryinus.

This name in the list of species, on page 29 of Pt. 1, three lines from the bottom, is by error printed as *Neogonatopus*.

Dryinus Latr.

The generic characters of female *Dryinus*, as given by different authors, disagree so in such essential points, that without specimens or an adequate description of the type species, I cannot fix these characters. Latreille in his characterization of the genus in 1809 clearly confounded characters peculiar to *Gonatopus* with those of *Dryinus*. His original description in 1805 is not accessible to me. Marshall in his paper describing *D. tarraconensis* gives no characters of use to me, but the figure of this insect is useful for generic purposes. Haliday shows well the distinction between the mouth-parts of *Dryinus* and *Gonatopus*. I herewith give some of the diverse characterizations of *Dryinus* as given by different authors.

Latreille, 1809.

Mandibles 4-dentate.

Maxillary palpi 5-jointed.

Labial 3-jointed or with 2 distinct.

Parapsides ?

Marshall, 1868.

Characters of mouth-parts entirely omitted.

Parapsidal furrows distinct in figure and parallel.

Haliday, 1833.

Maxillary palpi 6-jointed.

Other characters not mentioned.

Ashmead, 1893.

Mandibles 3-dentate.

Maxillary palpi 6-jointed.

Labial palpi 2-jointed.

Parallel parapsidal furrows figured on plate.

True Characters of *Dryinus ormenidis* Ashmead.

Mandibles 4-dentate.
Maxillary palpi 6-jointed.
Labial palpi 3-jointed.
No distinct parapsidal furrows.

Dryinus ormenidis Ashm.

Dryinus ormenidis Ashmead, (female); Ent. News, XIV, p. 192.

Labeo typhlocybae Ashmead, (male); loc, cit.; not *Labeo typhlocybae* Ashm. Mon. Proct. N. A. p. 89.

Swezey bred a number of males and females, determined as above by Ashmead, from cocoons obtained from the Fulgorid, *Ormenis pruinosa*. He rightly concluded that they were sexes of one species, as was subsequently confirmed by breeding hundreds of both sexes from cocoons sent from N. America by Koebele. Copulation was observed on many occasions. The males retained by Swezey do not in any way agree in the structure of the antennae with Ashmead's description of these parts in the original example of *Labeo typhlocybae*, bred by Riley from a *Typhlocyba* on *Celtis*. If that description is correct, it is not only utterly impossible that the type of *L. typhlocybae* can belong to the same species as the male of *Dryinus omenidis*, but further, it cannot be placed in the same genus in my opinion.

Ashmead's description of type of *Labeo typhlocybae*.	Description of three males in Swezey's collection.
"Antennae 10-jointed"; "the pedicel is more than twice as long as the scape; the first flagellar joint is two-thirds the length of pedicel; the fourth and fifth equal and a little longer than the first."	The scape is stout and as long or longer than the pedicel, not shorter; the first flagellar joint is very long, about equal to the scape and pedicel together, and distinctly longer than the following joints of the flagellum.

Chlorodryinus pseudophanes, sp. nov.

Black, the antennae, the margins of the pronotum (more widely at the sides posteriorly) and for the most part the front legs,

the tarsi, and the apical compressed abdominal segment, ferruginous. Scape of antennae in front and the clypeus marked with yellow, the mandibles yellow with red teeth. Wings with a transverse smoky band through the basal cells and a large ante-
Head in front dull and very densely punctured. Pronotum pubescent, shining, somewhat rugosely punctured; mesonotum quite dull, except the smooth anterior constriction, very densely sculptured, being finely granulate or shagreened; scutellum somewhat shining and punctured; propodeum with fine and close rugose reticulation. Abdomen smooth and shining. Length 4 mm.

Agrees well generically with *Chlorodryinus pallidus* in the incompletely margined head, the simple pronotum, the incomplete parapsidal furrows, etc., and only its superficial appearance is that of a *Paradryinus*.

Hab: Brisbane, Queensland; a single female was captured by Koebele on low bushes.

Neochelogynus ignotus, sp. nov.

Black, scape of antennae and front legs yellow or ferruginous, second and third joints of antennae obscurely reddish, the rest black. Middle and hind femora and tibiae more or less brown or dark-coloured, the tarsi except the apical joint pale yellow; the mandibles pale.

Head large, densely rugose or rugosely punctate, but the sculpture is not coarse, and is still finer on the front, which is clothed with silvery hairs. Pronotum rugose; mesonotum shining and sparsely punctate; the scutellum and post-scutellum smooth and shining; propodeum finely irregularly rugose, the posterior median area well defined, somewhat smoother, dull and rugulose. Wings with the stigma and radius fuscous, the rest of the neuration pale. Abdomen black, shining and impunctate. Length 3 mm.

This species in the sculpture of the head (which is much finer than in most of the allied species) agrees with *N. nigricornis*, the black antennae of the latter serving at once to distinguish it.

Hab: Sydney, N. S. W.; collected Feb. 2nd, 1905, by Koebele.

Prosanteon melanostigmus, sp. nov.

Black, the mandibles and scape of the antennae ferruginous, the front tibiae and front and middle tarsi pale ferruginous or

True Characters of *Dryinus ormenidis* Ashmead.

Mandibles 4-dentate.
Maxillary palpi 6-jointed.
Labial palpi 3-jointed.
No distinct parapsidal furrows.

Dryinus ormenidis Ashm.

Dryinus ormenidis Ashmead, (female); Ent. News, XIV, p. 192.

Labeo typhlocybae Ashmead, (male); loc. cit.; not *Labeo typhlocybae* Ashm. Mon. Proct. N. A. p. 89.

Swezey bred a number of males and females, determined as above by Ashmead, from cocoons obtained from the Fulgorid, *Ormenis pruinosa*. He rightly concluded that they were sexes of one species, as was subsequently confirmed by breeding hundreds of both sexes from cocoons sent from N. America by Koebele. Copulation was observed on many occasions. The males retained by Swezey do not in any way agree in the structure of the antennae with Ashmead's description of these parts in the original example of *Labeo typhlocybae*, bred by Riley from a *Typhlocyba* on *Celtis*. If that description is correct, it is not only utterly impossible that the type of *L. typhlocybae* can belong to the same species as the male of *Dryinus omenidis*, but further, it cannot be placed in the same genus in my opinion.

Ashmead's description of type of *Labeo typhlocybae*.	Description of three males in Swezey's collection.
"Antennae 10-jointed"; "the pedicel is more than twice as long as the scape; the first flagellar joint is two-thirds the length of pedicel; the fourth and fifth equal and a little longer than the first."	The scape is stout and as long or longer than the pedicel, not shorter; the first flagellar joint is very long, about equal to the scape and pedicel together, and distinctly longer than the following joints of the flagellum.

Chlorodryinus pseudophanes, sp. nov.

Black, the antennae, the margins of the pronotum (more widely at the sides posteriorly) and for the most part the front legs,

the tarsi, and the apical compressed abdominal segment, ferruginous. Scape of antennae in front and the clypeus marked with yellow, the mandibles yellow with red teeth. Wings with a transverse smoky band through the basal cells and a large ante-

Head in front dull and very densely punctured. Pronotum pubescent, shining, somewhat rugosely punctured; mesonotum quite dull, except the smooth anterior constriction, very densely sculptured, being finely granulate or shagreened; scutellum somewhat shining and punctured; propodeum with fine and close rugose reticulation. Abdomen smooth and shining. Length 4 mm.

Agrees well generically with *Chlorodryinus pallidus* in the incompletely margined head, the simple pronotum, the incomplete parapsidal furrows, etc., and only its superficial appearance is that of a *Paradryinus*.

Hab: Brisbane, Queensland; a single female was captured by Koebele on low bushes.

Neochelogynus ignotus, sp. nov.

Black, scape of antennae and front legs yellow or ferruginous, second and third joints of antennae obscurely reddish, the rest black. Middle and hind femora and tibiae more or less brown or dark-coloured, the tarsi except the apical joint pale yellow; the mandibles pale.

Head large, densely rugose or rugosely punctate, but the sculpture is not coarse, and is still finer on the front, which is clothed with silvery hairs. Pronotum rugose; mesonotum shining and sparsely punctate; the scutellum and post-scutellum smooth and shining; propodeum finely irregularly rugose, the posterior median area well defined, somewhat smoother, dull and rugulose. Wings with the stigma and radius fuscous, the rest of the neuration pale. Abdomen black, shining and impunctate. Length 3 mm.

This species in the sculpture of the head (which is much finer than in most of the allied species) agrees with *N. nigricornis* the black antennae of the latter serving at once to distinguish it.

Hab: Sydney, N. S. W.; collected Feb. 2nd, 1905, by Koebele.

Prosanteon melanostigmus, sp. nov.

Black, the mandibles and scape of the antennae ferruginous, the front tibiae and front and middle tarsi pale ferruginous or

yellowish, anterior femora and the intermediate and posterior femora and tibiae mostly dark, black or pitchy, hind tarsi dark above. Wings hyaline, stigma dark fuscous.

Head rugose from the coarse shallow puncturation, as also is the pronotum; mesonotum smooth and shining, with a few fine punctures; propodeum finely irregularly rugose, its posterior median are a well defined, smoother, and in certain aspects slightly shining. Length 3 mm.

Distinguished at once from *P. chelogynoides* by the dark stigma and the colour of the legs.

Hab: Mittagong, N. S. W.; collected on *Melaleuca*, January 18th, 1905, by Koebele.

PIPUNCULIDAE.

Pipunculus eutrichodes, sp. nov.

Head black, with the front and face covered with glistening white tomentum, posteriorly with greyish white at the sides, and fuscous in the middle. In the female the head between the eyes in front of the ocelli is shining black. Antennae black, third joint yellow (sometimes somewhat clouded) and distinctly acuminately produced at the apex. Thorax pilose, and clothed with fuscous tomentum, at the sides in front and on the pleura whitish; scutellum with long, fine, erect hairs; metanotum with dense whitish tomentum. Halteres yellow, dark at base. Legs black or piceous, tip of femora, tibiae, and tarsi yellow; the tibiae more or less infuscate or blackish, as also the apical tarsal joint. Abdomen black, shining, clothed with outstanding conspicuous longish pubescence, the first segment with a whitish tomentose band; the second in the female generally noticeably whitish, as also all the other segments at the sides in both sexes; the basal segment is without any row of black bristles at the sides; hypopygium less clothed than the other segments in the male (but similarly in the female) and more or less impressed at the base, with a smooth lateral lobe on the right side. Ovipositor straight and rather short. Wings distinctly smoky, stigma obscure brown, about as long as the fourth costal segment; neuration black or dark brown, more or less pale at the base. Length 3-3¾ mm.

Hab: Cairns district, Queensland. Not common.

DESCRIPTION OF PLATES.

Plate XXXIII.

1. *Eukoebeleia mirabilis*, female.
2. *Bruchomorpha sp?*, containing the ruptured larval sac of *Eukoebeleia*. Several sacs are often found on a single hopper, and both nymphs and adults (long- and short-winged alike) are affected.
3. *Phrynophryes sp.*; the left tegmen and rudimentary wing are displaced and show the empty sac, from which *Chalcogonatopus decoratus* was bred.
4. Nymph of *Tartessus*? in a much collapsed state, from the sac on which was bred a female *Prosanteon chelogynoides*.

Plate XXXIV.

1. *Eurinoscopus sp.*, nymph in ventral aspect, showing the empty larval sac of a *Neochelogynus destructor*, inserted in the usual position behind the posterior coxae.
2. *Euleimonios sp.* with empty larval sac of *Neochelogynus coriaceus* inserted in the neck.
3. *Athysanus curtisii*, with empty sac of *Neogonatopus brunnescens* placed on the abdomen. The left tegmen is somewhat displaced by the parasite.
4. *Liburnia sp.* nymph, shrunken and distorted, bearing two empty sacs of *Haplogonatopus americanus*.
5. *Colgar peracutus*, nymph much shrunken, with empty sac of *Paradryinus koebelei* beneath the left tegmen.
6. *Perkinsiella saccharicida*, nymph much collapsed and distorted, bearing two empty sacs of *Pseudogonatopus dichromus*. This hopper is an Hawaiian example, that was infected by a parasite imported from Australia, where it attacked small graminicolous *Liburnia*.
7. *Stenocranus dorsalis*, nymph with empty sac of *Pseudogonatopus stenocrani*, attached between the bases of the tegminal pads.
8. *Privesa aphorphoroides*? nymph much shrunken, and with the long fan-like caudal filaments removed, bearing two sacs of *Paradryinus venator*, one beneath the tegminal, the other beneath the alar pad. In life the beautiful fan-like filaments are turned back over the body, the parasitic sacs are only seen when the tail is depressed.

9. *Deltocephalus sp.*, nymph shrunken and distorted, bearing an empty larval sac of *Neoogonatopus dubiosus.*

Plate XXXV.

1. *Idiocerus*, nymph with the abdomen much shrunken, and bearing an empty sac of *Neochelogynus cognatus.*
2. *Perkinsiella saccharicida*, nymph with sac of *Echthrodelphax fairchildii* under the left tegmen.
3. *Ipo conferta* nymph, much shrunken and collapsed, bearing six empty sacs of *Paranteon myrmecophilus.* One of the sacs is not visible in the dorsal aspect of the hopper.
4. *Neodryinus raptor*, cocoon, subdiagrammatic. The two larval skins which are pierced by 8 distinct spiracles on each side, and form nearly the whole of the sac, are spread out as a roof over the middle part of the cocoon. This middle part contains the pupa, the large outer part of the cocoon serving for attachment to the leaf surface.
5. *Neodryinus koebelei* cocoon. The inner of the two skins is not pierced by evident spiracles, while those on the outer skin are but seven in number on each side, the three stigmata, at one end of each series, being much larger than the others. For the rest the cocoon is like that of *N. raptor.*
6. *Paradryinus threnodes*, empty cocoon, the insect having escaped by cutting out a cap, as seen at one end. The cocoon is densely studded with rounded portions, gnawed from the leaf-surface.
7. *Paradryinus koebelei*, empty cocoon; the patches of leaf-substance are less thickly strewn, and are of more elongate form.
8. *Neochelogynus destructor*; the subterranean cocoon is covered with particles of sand, so that the silken basis cannot be seen; the insect has emerged from the hole at one end of the cocoon, the cap having been entirely detached.
9. *Prosanteon chelogynoides*, female; chelae and adjoining tarsal joints.
10. *Thaumatodryinus koebelei*; chelae and the three preceding tarsal joints. The two teeth before the apex of the chelar claw, and the single lamellate spine near the tip, as well as the two kinds (long and short) of lamellae, placed alternately, on the fifth tarsal joint, are very remarkable in this genus, and were not noticed in my original description.

PLATE XXXVI.

1. *Paradryinus*; six-jointed maxillary and three-jointed labial palpi.
2. *Neodryinus koebelei*; six-jointed maxillary and three-jointed labial palpi.
3. *Prosanteon chelogynoides*; showing similar parts.
4. *Chalcogonatopus gigas*, showing the same.
5. *Neochelogynus nigricornis*; maxillary palpus with 6-joints.
6. *Eukoebeleia mirabilis*; maxillary palpus with six, labial with three joints.
7. *Paranteon myrmecophilus*, showing the same.
8. *Gonatopus australiae*; five-jointed maxillary palpus.
9. *Pseudogonatopus americanus*; four-jointed maxillary palpus.
10. *Neogonatopus dubiosus*; four-jointed maxillary palpus.
11. *Haplogonatopus americanus*; two-jointed maxillary, and two aspects of the two-jointed labial palpus.
12. *Epigonatopus solitarius*; two-jointed maxillary palpus.
13. *Echthrodelphax fairchildii*; four-jointed maxillary palpus.
14. *Paragonatopus nigricans*; two-jointed maxillary palpus.
15. *Pachygonatopus melanias*; three-jointed maxillary palpus.

All the above figures are are drawn with *camera lucida* from dissections mounted in balsam or glycerine; the very short basal joint of the maxillary palpus in some cases is not very distinct. The labial palpus of all the forms of which the maxillary palpi are represented by fig. 8-15, is very short and two-jointed, and is drawn only in the case of *Haplogonatopus* (fig. 11).

Plate XXXVII.

1. *Gonatopus australiae*, chelae.
2. *Pseudogonatopus dichromus*, chelae and preceding tarsal joints.
3. *Epigonatopus solitarius*, chelae.
4. *Paragonatopus nigricans*, chelae.
5. *Chalcogonatopus gigas*, chelae.
6. *Haplogonatopus americanus*, chelae.
7. *Pachygonatopus melanias*, chelae.
8. *Echthrodelphax nigricollis*, chelae.
9. *Neogonatopus vitiensis*, chelae and preceding tarsal joints.

It will be observed that fig. 1, 3, 5, 7, 9, show the similarity between the chelae of the forms of *Gonatopus*, *sensu*

lat., which preys on Jassids, while fig. 2, 4, 6, 8, show these parts in parasites of Gonatopus-like appearance, which prey on Fulgoroids, and which are also very similar to one another, but markedly distinct from those above mentioned. The new genera into which I have divided the old *Gonatopus* are easily determined by examination of these chelae, together with the mouth-parts figured on Pl. XXXVI, fig. 8-15.

10. *Paradryinus koebelei*, chelae and preceding tarsal joints.
11. *Neochelogynus*, chelae and two preceding tarsal joints.
12. *Neodryinus koebelei*, chelae, and three preceding tarsal joints.
13. *Paranteon myrmecophilus*, chelae and three preceding tarsal joints.
14. *Eukoebeleia mirabilis*, chelae. The single lamellate spine at the tip of the process of the fifth tarsal joint may be compared with that in the same position on the chelae of *Thaumatodryinus*.
15. *Paradryinus koebelei*; pronotum in profile, showing its very irregular outline.
16. *Chlorodryinus pallidus*; pronotum with almost regularly convex outline.
17. *Paradryinus*; mesonotum showing the parapsidal furrows.
18. *Chlorodryinus*; mesonotum showing the same.
19. *Echthrodelphax*; mesonotum showing the same.
20. *Neochelogynus*; mesonotum showing the same.

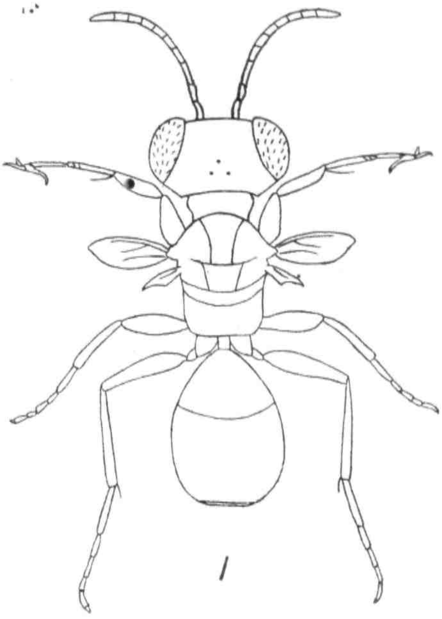
All the figures are drawn from female examples.

PLATE XXXVIII.

Paradryinus koebelei, showing the mode of disposition of the long front legs, when at rest. The body is supported on a part of the dorsum of the abdomen, which alone touches the surface on which the creature rests. In the case of the example figured the center of gravity is far in advance of the point of contact between the abdomen and the resting surface, but equilibrium is maintained by the grip of the claws of the middle and hind feet. The legs of the left side only are figured, those on the right side holding similar positions. In different species there is some variation in the positions assumed at rest, but the following genera, *Neodryinus*, *Paradryinus*, *Chlorodryinus*, *Thaumatodryinus*, and *Chalcogonatopus*, all rest on the recurved abdomen with the body suberect, or oblique, and

the front legs free, while the rest of the forms described by me assume a normal horizontal position when resting.

2. Head of *Echthrodelphax nigricollis*, male, showing its incrassate form.
3. Head of *Paragonatopus nigricans*, male, showing the usual form in this sex of *Gonatopus sensu lat.*
4. Arrangement of ocelli in *Neodryinus*, male.
5. Arrangement of ocelli in *Paradryinus*, male.
6. Ocelli of *Echthrodelphax*, female.
7. Antenna of female of *Paranteon*.
8. Antenna of female *Neochelogynus*.
9. Pedicel and two first funicle joints of female of *Thaumatodryinus koebelei*.
10. Two apical antennal joints of the same, still more highly magnified.
11. Antenna of male of *Echthrodelphax nigricollis*, showing its extremely slender form, a generic character.
12. Antenna of male of *Paragonatopus nigricans*, showing the less slender form of those organs in this and most of the genera formerly included in *Gonatopus*. This and the preceding figure are drawn under similar magnification.



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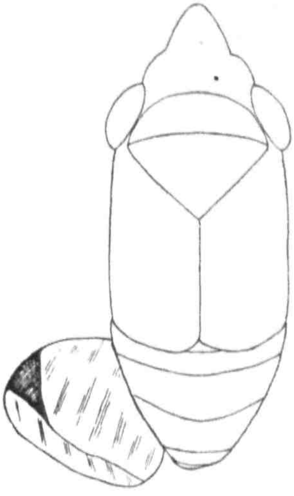

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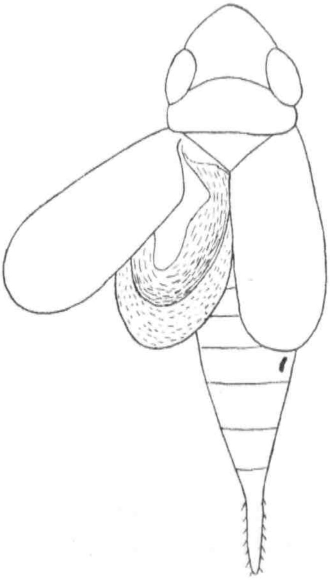

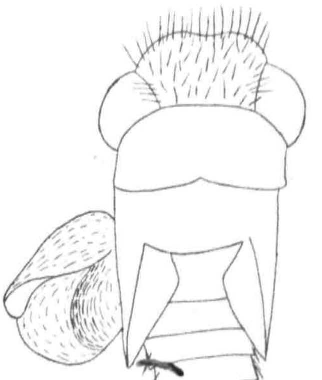

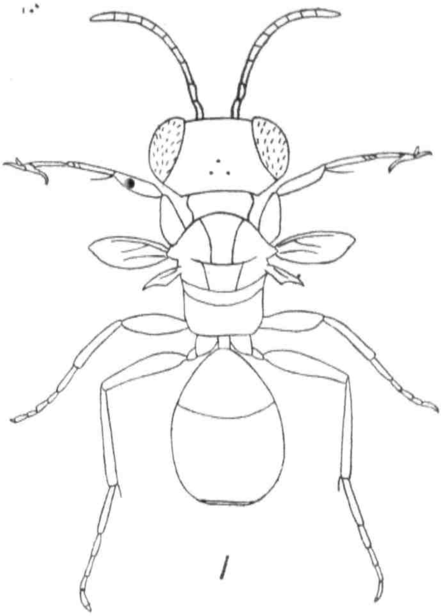

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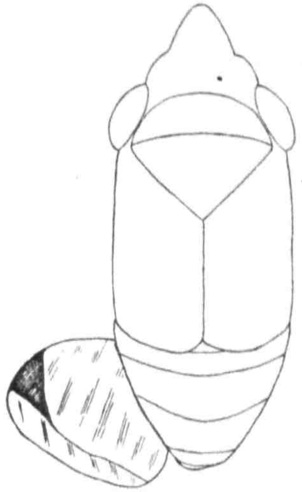

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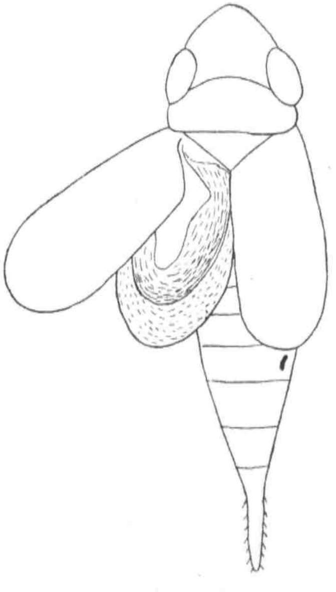

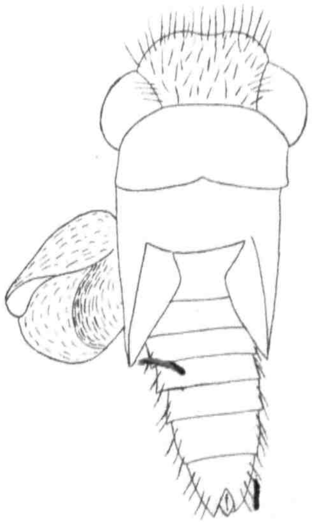

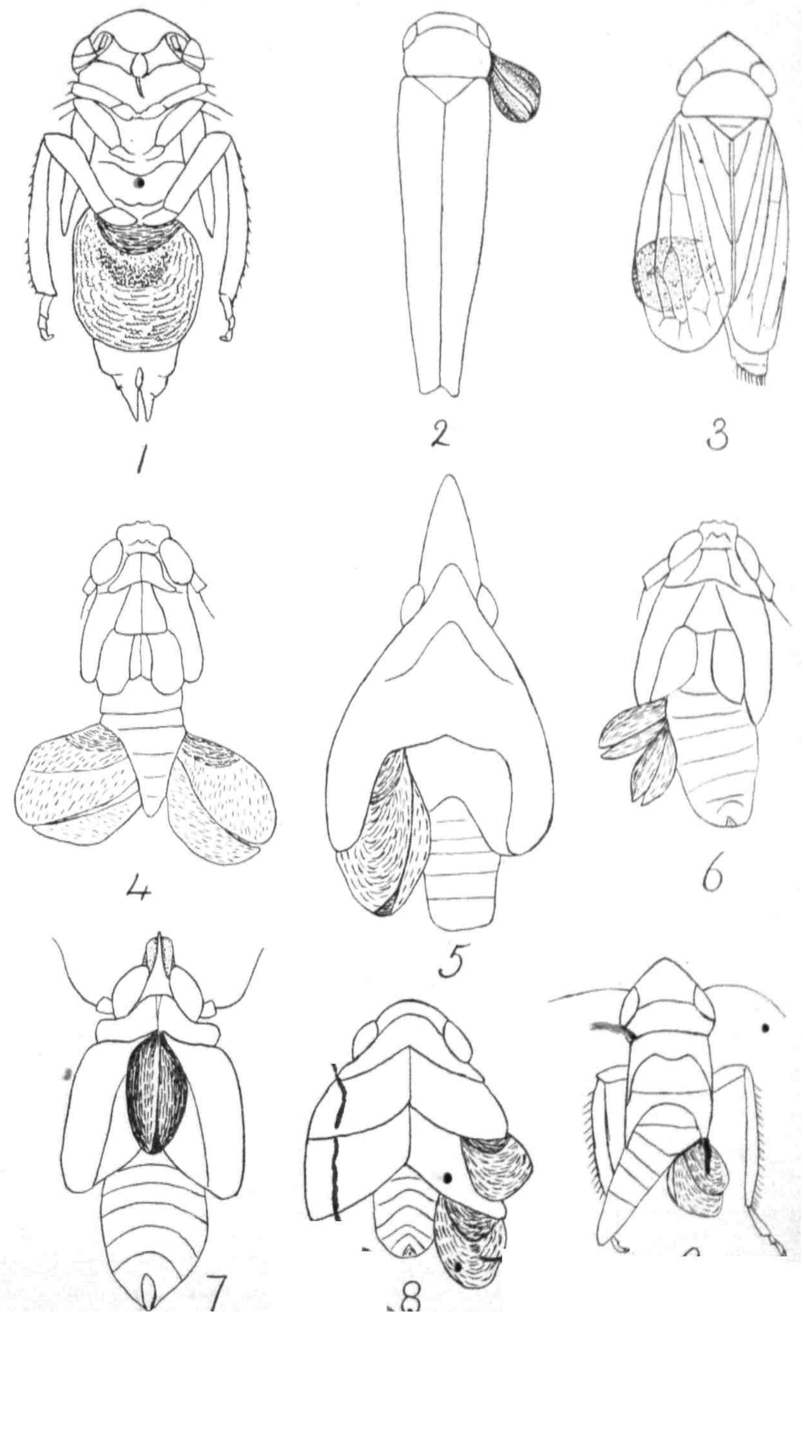
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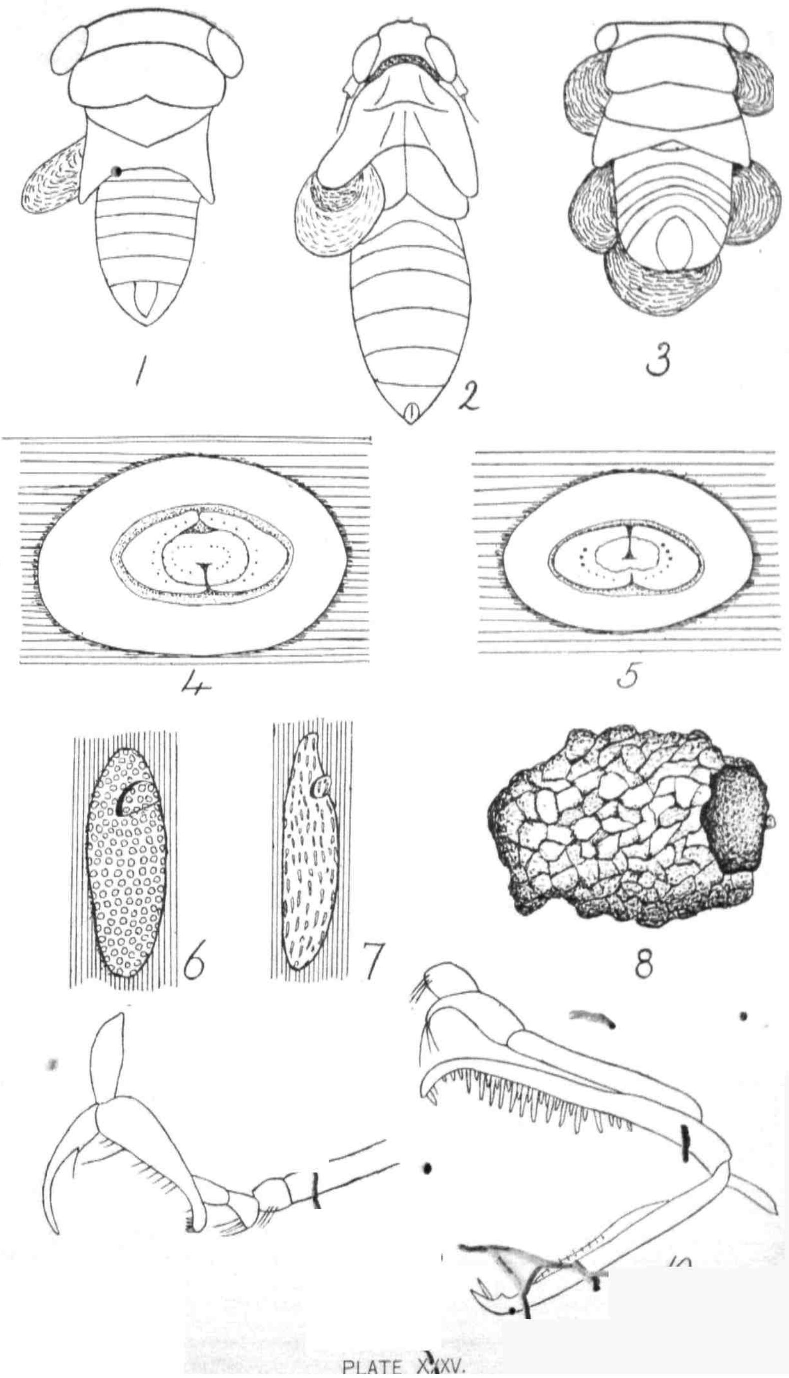

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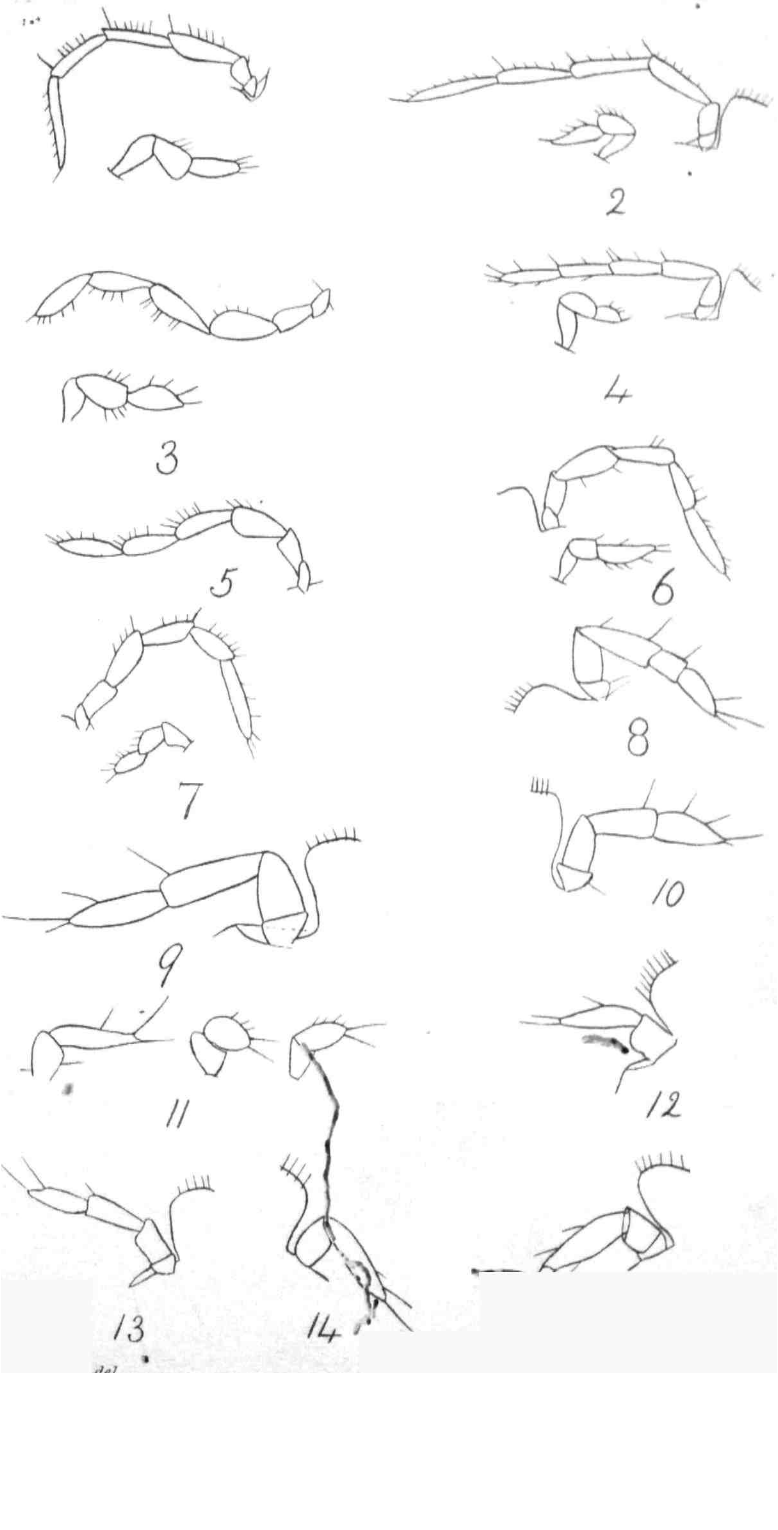
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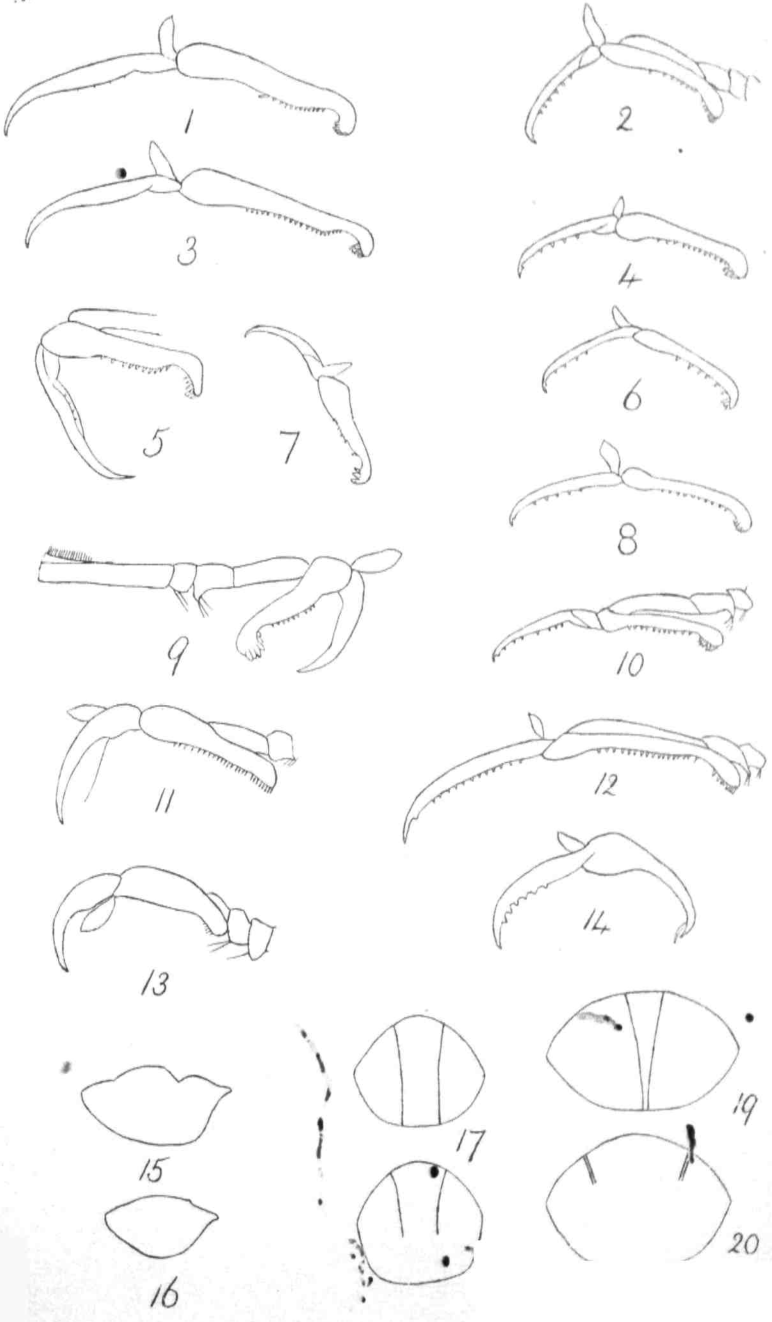
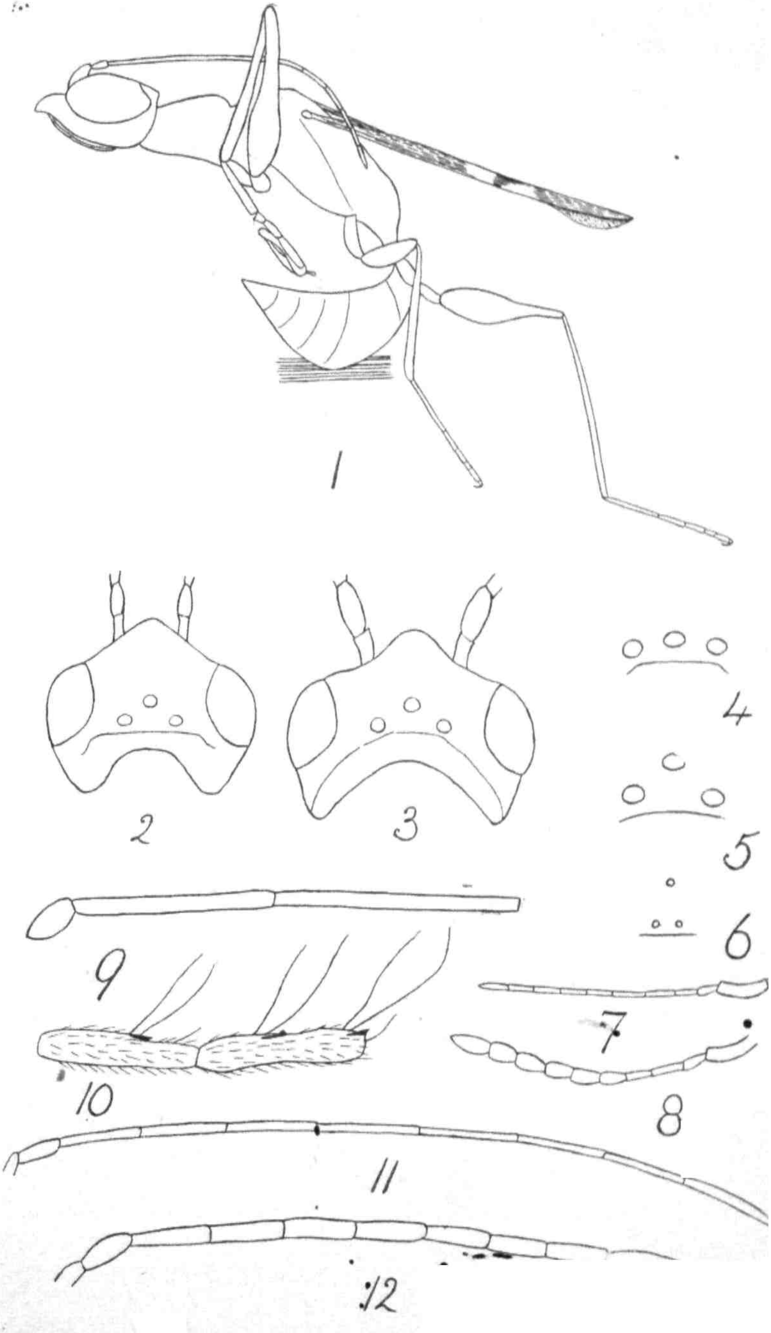


Perkins del.

PLATE XXXVII.



Perkins del.